### BEFORE THE TENNESSEE REGULATORY AUTHORITY

### NASHVILLE, TENNESSEE

SEPTEMBER 16, 1999

IN RE:	UNIVERSAL SERVICE PROCEEDING	)	DOCKET NO. 97-00888	
	INTERIM ORDER ON PI	HASE II OF	UNIVERSAL SERVICE	

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#### INTERIM ORDER ON PHASE II OF UNIVERSAL SERVICE

This matter came before the Tennessee Regulatory Authority (the "Authority" or the "TRA") at the regularly scheduled Directors' Conference on April 20, 1999, to make findings of facts and conclusions of law on the issues in Phase II of this docket. The Universal Service Docket was convened to establish an intrastate universal service funding mechanism pursuant to Tenn. Code Ann. § 65-5-207 (Universal Service), 47 U.S.C. § 214 of the Communications Act of 1934, as amended, the federal Telecommunications Act of 1996 (the "Telecom Act"), and Federal Communications Commission (FCC) Order 97-157, 12 FCC Rcd 8776 to 9616 (1997). Phase I established the guidelines and defined the parameters for the other two phases of this docket. Phase II identifies the appropriate cost methodology and calculates the required intrastate support needed, while Phase III will consider any necessary rate rebalancing. This is not a final Order, but shall be incorporated into any final Order as if fully rewritten therein.

#### I. BACKGROUND

In 1995, the Tennessee Legislature enacted the *Tennessee Telecommunications* Competition Act (the "Tennessee Act"); Section 1 became Tenn. Code Ann. § 65-4-123 and Section 18 became Tenn. Code Ann. § 65-5-207. Following the enactment of the Tennessee Act, the United States Congress passed the Telecom Act on February 8, 1996. Both the Tennessee Act and the Telecom Act address the preservation of universal telephone service at affordable rates. In § 254, the Telecom Act addresses universal service by establishing a funding mechanism "to ensure access to telecommunications services for low-income, rural, insular and high cost areas at a price comparable to those in lower cost areas for similar services." The Tennessee

The Telecommunications Act of 1996, Public Law 104-104, 104th Congress, February 8, 1996. 47 U.S.C. § 251 et. seq

FCC Order 97-157, 12 FCC Rcd 8780 (1997)

Legislature addresses the preservation of universal service in Tenn. Code Ann. § 65-5-207(a) by stating that "[u]niversal service, consisting of residential basic local exchange telephone service at affordable rates and carrier-of-last-resort obligations must be maintained after the local telecommunications markets are opened to competition. In order to ensure the availability of affordable residential basic local exchange telephone service, the authority shall formulate policies, promulgate rules and issue orders which require all telecommunications service providers to contribute to the support of universal service."

Responsibility for implementing the interstate portion of Universal Service in the *Telecom Act* has been delegated to the FCC by the United States Congress. The *Telecom Act* also sets forth the minimum criteria to be followed by the states in preserving and advancing Universal Service. Guidelines for implementation in this state are summarized in Tenn. Code Ann. § 65-5-207(a). On May 8, 1997, the FCC issued its *Report and Order, FCC Order No. 97-157*, that established "a plan that satisfies all of the statutory requirements, and puts into place a universal service support system that will be sustainable in an increasingly competitive marketplace."

On October 21, 1997, after reviewing the comments received in response to the Hearing Officer's Notice of Proposed Schedule and Request for Comments as well as the legal and policy issues presented by the participants, the TRA approved separating the Universal Service proceeding into two (2) phases. On February 17, 1998, the Authority approved the addition of a third phase to this docket to address rate rebalancing. The issues that were addressed in Phase I were adopted at a special Directors' Conference held on October 30,1997. Fifteen (15) issues, including subparts, were approved. The Authority's order on Phase I was issued May 20, 1998. Subsequent to the Phase I decision, a prehearing conference was held on February 3, 1998, to

<sup>&</sup>lt;sup>3</sup> FCC Order 97-157, supra note 2 (1997)

initiate Phase II of this docket. In that proceeding, the issues as proposed by the parties were adopted by the pre-hearing officer. The pre-hearing officer's report and recommendation was approved by the full authority on February 17, 1998.

On June 1, 1998, BST Telecommunications, Inc. ("BST") and United Telephone-Southeast ("UTSE") filed requests for reconsideration of specific Phase I issues. These requests were considered by the Directors at a regularly scheduled Authority Conference held on August 4, 1998. The Authority's decisions regarding the same were memorialized in an order entered on November 2, 1998.

On April 14, 1999, BST filed a motion to take official notice of the reductions in BST's intrastate access rates since the hearing in this docket. BST also requested that to the extent that the Authority does take intrastate access rates into account in calculating the revenue benchmark for universal service or in establishing the state universal service fund, the Authority should use revenues based on current access rates as well as take official notice of BST's April 1, 1999 tariffs that set forth those rates.

On April 16, 1999 UTSE filed its motion to postpone consideration of certain Phase II issues. UTSE specifically requested that the Authority postpone deliberations of Issues 17b, 17d and 22 until no more than six (6) days after a final ruling by the FCC in CC Docket 96-45. The Directors of the Authority considered both UTSE's Motion to Postpone and BST's Motion to take Official Notice at a regularly scheduled Authority conference held on April 20, 1999. After careful consideration of the same, the Directors unanimously voted to deny UTSE's motion finding that it was appropriate and efficient to proceed with a decision on all Phase II issues. Then citing the Authority's Interim Order on Phase I of Universal Service dated May 20, 1998, the Directors unanimously determined that because the issue had already been so decided, BST's

motion was rendered moot.

The following Orders previously issued by the TRA are of significance in this proceeding: Interim Order on Phase I of Universal Service; Order Designating Eligible Telecommunications Carriers Pursuant to 47 U.S.C. § 214(e), the Telecommunications Act of 1996 Section 254 (C) and FCC Order 97-157; Order Establishing Intrastate Discounts For Schools and Libraries Pursuant To Section 254(h) of the Telecommunications Act of 1996 and FCC Order 97-157; Order Establishing Procedures for Lifeline Consents Pursuant to Section 214 (e) of the Telecommunications Act of 1996 and FCC Order 97-157; and Order Establishing Procedures for Self-Certification of Rural Telephone Companies Pursuant to Section 153(37) of the Communications Act, As Amended, and FCC Order 97-157.

#### II. PARTIES TO THE PROCEEDING

At the second Pre-Hearing Conference held September 23, 1997, the Hearing Officer admitted the following entities as Parties with full rights of participation: AT&T Communications of the South Central States, Inc. ("AT&T"), BellSouth Cellular Corp., BellSouth Telecommunications, Inc., Ben Lomand Rural Telephone Cooperative, Citizens Local Exchange Carriers, Coalition of Small LECs and Cooperatives, Office of the Attorney General Consumer Advocate Division ("CAD"), DeKalb Telephone Cooperative, Inc., Electric Power Board of Chattanooga, GTE Mobilnet, MCI Telecommunications Corp. (MCI), NEXTLINK Tennessee LLC (NEXTLINK), North Central Telephone Cooperative, Time Warner Communications of the Mid-South, Twin Lakes Telephone Co., United Telephone-Southeast ("UTSE") and Sprint Communications L.P. ("Sprint"), West Kentucky Rural Telephone Cooperative Corp., Yorkville Telephone Cooperative, the Tennessee Municipal Telecommunications Group, and TCG MidSouth, Inc.

The following entities filed requests for permission to monitor the proceeding: Deltacom, Inc., Phoenix Network, Inc., Standard Communications Co., 360° Communications Company, WorldCom, Inc., AVR L.P. d/b/a Hyperion of TN L.P., LCI International Telecom Corp., TN Department of Finance and Administration, TN Department of Education and Charlene Taylor (Chaz Taylor, Inc.).

#### III. EXECUTIVE SUMMARY

In the Telecommunications Act of 1996, Congress directed the FCC and the states to take the steps necessary to establish support mechanisms to ensure the delivery of affordable telecommunications service to all Americans, particularly low-income consumers, eligible schools and libraries, and rural health care providers. To accomplish that directive, the FCC and the states are to devise methods to ensure that consumers in all regions of the Nation, including low-income consumers as well as consumers in rural, insular, and high cost areas, have access to telecommunications and information services at rates that are reasonably comparable to rates charged for similar services in urban areas. Congress also directed the FCC to define additional supported services that are to be provided to eligible schools, libraries, and health care providers. Further, Congress directed the FCC to establish competitively neutral rules to enhance access (to the extent technically feasible and economically reasonable) to advanced telecommunications and information services for all public and non-profit elementary and secondary school classrooms, health care providers, and libraries.

Tennessee law (Tenn. Code Ann. § 65-5-207) requires that "[u]niversal service, consisting of residential basic local exchange telephone service at affordable rates and carrier-of-last-resort obligations must be maintained after the local telecommunications markets are opened to competition. In order to ensure the availability of affordable residential basic local exchange

telephone service, the authority shall formulate policies, promulgate rules and issue orders which require all telecommunications service providers to contribute to the support of universal service."

#### **Addressing Universal Service in Three Phases**

The TRA is addressing Universal Service in three phases. Phase I determined the appropriate processes for identifying implicit subsidies and for structuring the intrastate Universal Service Fund.<sup>4</sup>

Specifically, the TRA's Phase I Order found that "the cost studies should reflect the estimated costs for each wire center" and that "support shall be provided on the primary access line of residential subscribers in high cost areas regardless of the subscriber's income level." The Authority also found that "cost studies shall include the network components needed to provide all of the services included in the revenue benchmark. At a minimum, the entire loop and port, reasonable allocations of switching costs, tandem switching, transport and any software necessary to provide the services in the revenue benchmark must be included in calculating the forward-looking cost for each wire center."

While the proponents of the BCPM 3.1 ("BCPM") and HAI 5.0a ("HAI" or "Hatfield") models recommend use of their respective model and rejection of the other, the Authority does not adopt or eliminate either model at this time. In the examination of the sub-issues that follow, neither model's approach is so strong as to justify the elimination of the other model based solely on the former model's performance with respect to any single issue. At this time, the TRA does not have sufficient information on the performance of the models to recommend one model over

<sup>&</sup>lt;sup>4</sup> Implicit subsidies exist in telephone rates today because many of these rates were based upon previous policy decisions, and not the true costs of the services. The Authority determined that implicit subsidies may exist among geographic areas, classes of service and between services included in the revenue benchmark and those identified as "core" services. Identifying the implicit subsidies in current rates and making those subsidies explicit is the primary purpose of the rate rebalancing, which will occur in Phase III.

#### the other model.

The purpose of Phase II is to determine the amount of support needed to comply with the decisions reached in Phase I. In Phase II, the Authority analyzed the Universal Service models presented by the parties and has required changes to those inputs of the models. Once the studies are resubmitted with the changes required by this order, the Authority will re-evaluate the models and select a single model or an alternative approach for calculating the size of the fund.<sup>5</sup>

The rate rebalancing required by Tenn. Code Ann. § 65-5-207 and the remaining administrative issues are to be addressed in Phase III. In its Phase I Order, the TRA found that after the minimum amount of Universal Service support is initially determined in Phase II, the affected companies should file proposals to rebalance rates, including a plan to collect the resulting final support needed for Universal Service. In Phase III of this proceeding, the TRA will consider proposals to reduce rates by the amount of the minimum Universal Service support, as well as other rate adjustments proposed by the companies.

#### The Models

Two models have been presented by the parties for estimating Tennessee's intrastate Universal Service costs, the BCPM and the HAI models. The presenters of these models contend that the models are designed to comply with the criteria for forward-looking economic cost determinations as established in paragraph 250 of the FCC's Universal Service Order (97-157). These criteria establish inputs and the inclusion of services as defined by the FCC for the interstate Universal Service Fund. The parties started with models incorporating these criteria and then made adjustments in an attempt to estimate the cost for Universal Service as defined in the Phase I Order. The Authority's findings contained in this order adjust the inputs in the models to arrive

<sup>&</sup>lt;sup>5</sup> Contributions to the fund and certain administrative issues are also addressed in Phase II.

at an estimated cost for Universal Service that is compliant with the Phase I Order.

#### Phase II - Summary of Findings

Many of the findings by the Authority on the model inputs are the same as decisions in the Permanent Price Docket (97-1262). For example, the Authority's decision on drop length (Issue 16d), structure sharing (Issue 16e), depreciation (Issue 16s), operating expenses (Issue 16t), and switching costs (Issue 16p), mirror the decision in the Permanent Price Docket.

Aside from identifying the appropriate inputs for the two models, the Authority also identifies in this phase how implicit support will be made explicit, i.e., determine how the total size of the fund will be calculated. The Authority finds that the minimum amount of universal service support necessary for the high cost areas is to be determined by summing the amounts by which costs exceed the revenue benchmark in all high cost wire centers, then subtracting the amount of federal support. In Phase III, the TRA will consider proposals to reduce rates by the amount of the minimum support, as well as other proposed rate reductions which further reduce implicit subsidies and which may increase the necessary support.

The Authority also finds that contributions to the Universal Service Fund are to be based upon all telecommunications carriers' percentage of total intrastate retail "end user" revenue, similar to the approach adopted by the FCC for the interstate universal service fund. Carriers contributing to the Universal Service Fund are allowed to recover their contributions from customers, but the method of recovery will be determined in Phase III after the size of the fund is identified. Additionally, the Authority will initiate a rulemaking for the purpose of establishing new telephone quality of service standards to replace existing TRA service standards in Chapter 1220-4-2.

Finally, the Authority notes that neither BST nor UTSE submitted a revenue benchmark in

Phase II that complies with the Phase I Order in this proceeding, and that these parties need to provide other parties with the line counts needed to complete their studies.<sup>6</sup>

To complete the cost revenue benchmark studies, the Authority adopts the following schedule:

- 1. BST and UTSE shall file compliant revenue benchmark studies, including detailed support, with the Authority and parties within seven (7) days of the date of this order;
- 2. BST and UTSE shall provide the line counts and primary residential lines for each wire center to the Authority and the parties within seven (7) days of the date of this order;
- 3. Each party shall submit revised cost studies and supporting calculations, compliant with this order and the Phase I order, within fourteen (14) days of the date of this order. Cost studies shall be submitted both in writing and electronically. Each party shall submit a spreadsheet for each wire center showing:
  - a) the number of primary access lines;
  - b) the revenue benchmark per primary access line;
  - c) the average compliant cost per primary access line per the BCPM model;<sup>7</sup>
  - d) the average compliant cost per primary access line per the HAI model;<sup>8</sup>
  - e) the CLLI code. This spreadsheet shall be submitted both in writing and electronically using Microsoft Excel.
- 4. Each party shall submit comments on the compliant cost studies and revenue benchmark submissions within thirty (30) days of the date of this order.

This schedule gives all parties the opportunity to comment on the studies submitted by each party prior to the Authority's decision on the studies.

<sup>&</sup>lt;sup>6</sup> It was determined in Phase I that the revenue benchmark used in calculating support for each wire center shall be the average revenue per residential line for that wire center. Studies submitted by BST and UTSE utilize statewide averages for numerous components of the benchmark. Averages for each wire center should be calculated as opposed to average revenue for all wire centers. Similarly, the cost studies should reflect the estimated costs for each wire center.

<sup>&</sup>lt;sup>7</sup> Average costs shall be compliant with the findings in this order and in Phase I of this docket.

<sup>&</sup>lt;sup>8</sup> Average costs shall be compliant with the findings in this order and in Phase I of this docket.

#### IV. SPECIFIC FINDINGS OF FACT AND CONCLUSIONS OF LAW

Testimony on the Phase II issues was presented by the Parties during a hearing (the "Hearing") held April 15-22, 1998. After hearing the Parties' testimony, reviewing pertinent portions of the record, and fully considering the positions of the Parties, the TRA deliberated on these matters at its April 20, 1999 Directors' Conference and unanimously made the following specific findings of fact and conclusions of law on the Phase II issues:

### ISSUE 8c: How does the TRA make implicit support explicit as defined by the Act and the FCC?

In making implicit support explicit, a two-step process is required in which implicit subsidies are first identified and second, made explicit. Subsidies for specific geographic areas are identified, leaving in place the implicit subsidies among the services in the revenue benchmark and the "core" universal service services. Identifying and making explicit these latter subsidies is the purpose of rate "rebalancing" in Phase III.

#### **Positions of the Parties**

BST Telecommunications (BST) states that making support explicit involves separately identifying this support and setting it aside in the universal service fund into which all telecommunications providers contribute in a competitively neutral fashion (Phase II Brief, p.1-2; Martin, Tr. Vol. III A, pp.19-26; Taylor, Tr. Vol. II C, pp.208-219).

In opposition to the TRA's Phase I decision on the revenue benchmark, BST witness Taylor suggests that this involves comparing only the cost of the universal service "core" to revenues received for the "core" services (Taylor Rebuttal, p. 4, 13). The total amount of support is determined first, then federal support is subtracted to leave state support. After which "the TRA should hold a proceeding in which it would consider proposals of incumbent LECs as to how rates should be reduced to remove the implicit subsidies that have been quantified" (Phase II

Brief, p. 2). Furthermore, competitive neutrality requires the creation of a funding mechanism to support competitors' provision of universal service, especially in high cost areas (Martin Rebuttal, p. 2).

To a large extent, United Telephone-Southeast, Inc. (UTSE) agrees with BST that making implicit subsidies explicit involves identifying these amounts and including them in the Universal Service funding mechanism, less federal support payments (Phase II Brief, p. 43). The parties would then file proposals to rebalance rates, including a plan to collect the resulting support needed for Universal Service (Phase II Brief, p. 39; Parrott, Tr. Vol. III C, pp. 121-126). UTSE disagrees with the TRA's revenue benchmark, because including the revenues from services that are sources of implicit subsidies for Universal Service will result in support that is too low and consequently not attract competitors to serve these customers (Phase II Brief, p. 43; Taylor, Tr. Vol. II C, p. 216; Parrott, Tr. Vol. III C, pp. 121-124).

MCI contends that many services are priced above cost for the benefit of stockholders, not Universal Service. Any subsidy to Universal Service is only a subset of these excessive revenues. All prices in excess of cost should be eliminated and only the Universal Service support portion recovered through a Universal Service Fund. Responsibility for this Fund should be allocated by end-user billed revenues of all telecommunications carriers, less payments to other carriers, and should be recovered as an explicit surcharge to retail customers (Phase II Brief, pp. 2-3; Hyde Direct, p. 3; Hyde Tr. Vol. III B, p. 87). Further, only those wire centers where the cost exceeds the revenue benchmark should receive support and only to the extent of this differential (Phase II Brief, p. 36; Hyde Direct p. 4).

In contrast, AT&T claims that the statewide aggregation of revenues less costs across all wire centers will result in no support needed for Universal Service, as revenues will exceed costs

(Phase II Brief, p. 8; Gillan Direct, pp. 4-6, 11-12). Further, to require payments in support of universal service in this situation will violate Tennessee and Federal law (Tenn. Code Ann. § 65-5-207; 47 USCA 254(e)), because such payments are not necessary and will not be competitively neutral. Nor will such payments benefit consumers as required by law (Tenn. Code Ann. §§ 65-4-123 and 65-5-207; FCC Universal Service Order, para. 48-49; Phase II Brief, p. 10-11).

The remaining parties did not treat this issue in their briefs, nor in-depth in their testimony. William Barta, testifying for Time Warner Communications and the Tennessee Cable Telecommunications Association (TW-TCTA), states that the TRA should compare the revenues to the costs (forward-looking and embedded) for all categories of services in order to assess the current level of universal support and the subsidy required prospectively (Direct, pp. 6-7). Further "to the extent that the universal support is overestimated and, therefore, overfunded and there is no rebalancing of rates to identify the implicit support in other rates, then the -- to the extent that the universal service support is overfunded, that will contribute to a windfall, to the benefit of the incumbent local exchange carrier" (Tr. Vol III D, p. 237; also see p. 251). Steven Watkins, testifying for the Coalition of Small LECs and Cooperatives (Coalition), stated that new state and federal mechanisms to support universal service in high cost areas will be needed as competition erodes the sources of existing implicit subsidies (Direct, pp. 3-4).

#### **Findings**

The Authority finds that the minimum Universal Service support is the total difference between the cost and the revenue benchmark summed over the wire centers in which cost exceeds revenue, less federal support. In Phase III, the TRA will consider proposals to reduce rates by the amount of the minimum support, as well as other proposed rate reductions which further reduce implicit subsidies and which may increase the support necessary (rate "rebalancing"). This is a

logical extension of the TRA's Phase I Order and is similar to the approaches of BST, UTSE, and TW-TCTA in their use of rate rebalancing in Phase III. The support needed for universal service in high cost wire centers is determined in Phase II and this amount less federal support is the minimum size of the Universal Service Fund (USF). Phase III's rate rebalancing must reduce rates by at least this minimum amount. Phase III, however, also allows the parties to propose additional rate reductions to identify and eliminate additional implicit subsidies. The TRA's acceptance of any of these additional reductions would increase the size of the USF, which is still calculated as the total of the differences between the revenue benchmark and cost for all wire centers where cost exceeds revenue, but at the new Phase III rates.

<sup>&</sup>lt;sup>9</sup> The positions of AT&T and MCI are inappropriate as they deny support to competitors in high-cost wire centers or require a rate-case proceeding to alter telephone rates apart from Universal Service concerns. The TRA approach, in contrast, may reach the conclusion recommended by BST witness Dr. Taylor- that support equal the amount by which the Universal Service "care" costs exceed the revenues from those services alone- but by a different route.

#### ISSUE 14: Are any changes in state laws or rules needed?

In considering whether any changes in laws or rules are necessary, the Authority formulated specific questions to obtain the opinions of parties as to whether there were any: (1) conflicts between state and federal statutes on universal service; (2) need to change Authority rules to implement universal service; or (3) need for legislation if the Authority chose to appoint a third party administrator of the fund. Those questions are as follows:

- a. Is there a conflict between the provision in the federal statute and the Tennessee statute that universal service support should be explicit?
- b. How does the TRA reconcile the Tennessee universal service statute with the federal statute on "sufficient" universal service funding?
- c. Will rules have to be changed to allow various regulatory schemes so as to provide for recovery of any universal service contributions?
- d. Will rules have to be changed to allow transition for carriers operating under various regulatory schemes?
- e. Is legislation needed to appoint a third party administrator?

#### **Positions of the Parties**

Although a great deal of evidence on these issues was offered in Phase I of this docket no new testimony was offered on this issue in the Phase II hearings. In their briefs and proposed findings, the parties relied upon their prior positions as stated in written filings and/or through stipulations. BST witness Martin offered very brief testimony that echoed BST's stipulated position.

At the suggestion of AT&T the Authority requested and has received an opinion from the Attorney General relative to the questions of whether interest earned by the Universal Service Fund would revert to the General Fund, and whether the TRA could contract out the administration of the Universal Service Fund, should it so decide. [See also Issue 24]. The

Attorney General opined that "pursuant to Tenn. Code Ann. § 65-5-207, the funds from contributing utilities must be deposited with the Treasurer of the State of Tennessee, and the interest generated by those funds will become public money and revert to the general fund." (Opinion No. 98-177, August 28, 1998) The Attorney General also found that neither "Tenn. Code Ann. § 65-5-207 nor other statutes pertaining to the TRA vest in that agency the power to enter into the type of contracts and agreements that would be necessary for the TRA to delegate its authority to administer a Universal Service Fund." (Id.)

#### **Findings**

The TRA will promulgate the necessary rules and procedures to administer the universal service fund [see Issue 24c]. In addition, the Authority may seek legislative action to allow interest earnings on the fund to inure to the benefit of the fund.

# ISSUE 16: What cost model or method should be adopted to calculate needed universal service support? Note: the word method is used to mean "algorithm(s) and input value(s)."

Issue 16 addresses the technical inputs to the cost models. In the following subparts of Issue 16, the Authority details its required changes to these inputs.

#### 16a. What method should be used to distribute population within service areas?

Both cost models, HAI and BCPM, start with census data at the census block level to calculate the cost of services in the revenue benchmark. In urban areas, census blocks are small and different methods of locating customers within census blocks are not likely to cause large differences in costs. In rural areas, however, census blocks may be large and the method of locating households within them may affect the estimated costs, due to variations in the lengths of loops as well as other cost-sensitive characteristics.

As the wire center locations are fixed under the "scorched node" approach employed by the models (consistent with the TRA's Order in Phase I, Issue 9), locating customers to be served from each wire center is the first step in designing a forward-looking network to serve them. This information is used in the calculation of outside plant costs considered in subsequent parts of Issue 16.

#### **Positions of the Parties**

BST and UTSE claim that the BCPM locates customers more accurately than the HAI model in rural areas, while AT&T and MCI claim that the HAI is superior to the BCPM (Post Hearing Briefs: BST p. 7; UTSE p. 9; AT&T p. 14; MCI p. 4); their contentions are summarized below. The remaining parties do not address the issue with any specificity, concentrating on the inputs to the models rather than on the models themselves. For example, TCTA-TW states that

"the differences in customer location produced by the models are not as significant as other useradjustable inputs to the models."

The BCPM locates customers by first delineating, by latitude and longitude, the boundaries of each wire center serving area. Each of these areas is then divided into "microgrids" that are approximately one tenth of a mile in area. Customers are assigned to a microgrid based on the share of the applicable census block's road mileage accounted for by that microgrid. The microgrids are then aggregated into "ultimate grids" with a maximum size of 12,000 feet by 14,000 feet, roughly six square miles. Next, the "road centroid" of each ultimate grid is located and the ultimate grids are divided into quadrants centered on the road centroid. Each quadrant that contains roads is a distribution area to which is attributed distribution plant as built by the model (Duffy-Deno, Tr. Vol. I B, pp. 114-142). Customers are allocated to quadrants by road mileage, but the actual distribution area is a square, centered on the road centroid of the quadrant, equal in area to a 500 foot buffer along each side of the roads within that quadrant. Customers are evenly distributed throughout this area (BCPM 3.0 Model Methodology, p. 31).

The HAI model locates customers using a process called "geocoding." Geocoding matches customers to addresses, then locates those addresses by latitude and longitude. Customers for whom geocoding data is not available are spaced evenly along the borders of their census block. These customer locations are then formed into odd-shaped clusters based on technological constraints (loop lengths, etc.). These clusters are then given a rectangular shape with the same area as the original cluster and divided into equally spaced rectangular lots, one for each customer. Feeder facilities are "built" to each cluster and distribution plant is "built" to serve customers in these rectangular lots. (Wood/Pitkin rebuttal Testimony, pp. 40-64; Wood Exhibit DJW-2; Wood Tr. Vol. IV A, pp. 4-8; Pitkin Tr. Vol. V A, pp. 5-15).

#### **Findings**

The Authority does not select either customer location method at this time. Neither of the customer location algorithms proposed by the parties is inherently unreasonable. Precise geocoding of customers is probably the superior approach, as AT&T claims, but not all customers can be geocoded. Geocoding, however, is least successful in the rural areas where customers are more dispersed and the costs of serving them are higher. Thus, both models must estimate all or most customer locations in the lower density areas. The BCPM approach of using road mileage to distribute customers is not speculative or unreasonable, nor is HAI's placement of non-geocoded customers on census block ("CB") borders, a practice that should act to overestimate costs. The models are remarkably similar in establishing stylized distribution areas, where customers are evenly spaced, the basis for which distribution plant is actually designed and costed.

The arguments then become perilously circular. AT&T argues that HAI's placement of customers along CB borders usually places them along roads. Since roads are often CB borders, the BCPM places even more customers on the CB borders than does HAI (Post-Hearing Brief, pp. 25-26). BST admits that 70% of roads in Tennessee are on the exterior of CBs, then criticizes HAI for ignoring the 30% that fall on the interior of CBs during the placement of non-geocoded customers (Post-Hearing Brief, p. 9).

The basic problem is that the models can not be empirically verified. The analyses presented by the parties attempt to measure how close the models' placement of customers approaches actual customer locations in some relatively small area. This is the wrong question to ask. Rather, the better question is how well do the models mimic the distribution of cost contributing factors associated with customer locations by wire center? That question has not been answered.

Consequently, the selection of a particular location algorithm, which would essentially eliminate one of the cost models from further consideration, is not appropriate at this time. The Authority finds that it would be better to put the models on a more equal input footing and attempt to judge their subsequent performance rather than to arbitrarily select a model based solely on the location method.

# 16b. What method should be used to match a model's wire center line count to a LEC's existing wire center line count?

In this proceeding, the models do not match wire center line counts to actual lines served at each wire center unless this is specified; instead, the models base wire center line counts on the demographic data.

#### **Positions of the Parties**

The BCPM matches actual wire center line counts in the BST and UTSE areas, since these were entered by the respective companies (Gasper, Tr. Vol. I A, pp. 104-105; Laemmli, Tr. Vol. II A, pp.75-76; Caldwell, Tr. Vol. II B, pp.175-76). BST's BCPM, as filed with the TRA on March 3, 1998, used 1996 line counts, although BST claimed that 1997 line counts "....will be available in late March or early April" (Letter from Guy Hicks to David Waddell, March 3, 1998, p. 2).

The HAI model conforms wire center line counts so that a company's actual state-wide service territory line counts are matched by the model (HAI "Model Description," pp. 24-27). The parties sponsoring the HAI model have no objection to matching actual line counts at the wire center level, so long as this data is provided by BST and UTSE (Wood, Tr. Vol. IV B, pp. 129-131).

#### **Findings**

To achieve consistency between the models, the Authority finds that wire center line counts in both models shall be the most recent available counts of actual lines served by each wire center. The wire center line count data must be provided by BST and UTSE to the other parties in order for them to run their models.

16c. What method should be used to determine the proper outside plant mix (i.e., the fractions of aerial, underground and buried cable) and associated materials and installation costs?

The Outside Plant Mix is an engineering decision heavily influenced by the terrain and the number of customers which that plant must serve. The decision-making process used by the engineers is based on mechanical formulas for both models under consideration. The BCPM model supported by BST and UTSE purport to follow formulas employed today by telephone companies when designing the outside plant. The HAI model, supported by AT&T and MCI, employs an approach that they claim reflects future trends on how the outside plant of tomorrow will look. The cost of material and installation are simply input data required to make the cost computations once the design is complete.

#### **Positions of the Parties**

Both models employ look-up tables to determine the proper mix of aerial, underground and buried cable. BST and UTSE rely heavily on the judgment of their experienced outside plant engineers to establish the default plant mix values. Both companies argue that their in-house experience with the design of their networks as well as their up to date knowledge of what's available from vendors places them in the best position to compute the proper mix of facilities and their associated costs. With respect to the issue of "forward looking" design, UTSE asserts that

"[b]y anyone's definition, UTSE is building a least-cost forward-looking network today" (Laemmli, April 16, 1998 transcript, Volume II A, page 11).

AT&T testified to using experienced outside plant engineers to develop the HAI approach to the outside plant mix. This approach reflects trends identified by Bellcore (the former Research and Development arm of the Bell Operating Companies), outside plant engineers, architects, property developers and builders, all of whom AT&T contends will affect the outside plant mix of the future (Wood, Exhibit DJW-3, pages 29 & 30).

#### **Findings**

Both approaches appear to be reasonable. Therefore, the Authority requires no specific model changes relative to this issue.

#### 16d. What method should be used to determine drop lengths and associated costs?

"Drop" is the wire that connects the network interface device (NID) on the side of the customer's premises to the remainder of the network (either at the pole or the pedestal). The drop cost is determined by multiplying the drop length by the cost for material and associated labor per foot of drop wire.

#### **Positions of the Parties**

AT&T proposes drop wire lengths that range from 50 feet in the most densely populated areas to 150 feet in rural density zones. For the HAI model, these estimates are based on the observation that houses and buildings normally are placed towards the front of lots and that efficient carriers will run drop wires from the front of the property line to the premises (Wood, Ex. DJW-3, 15). AT&T proposes that "all buried drop wire should be two-pair" (Wells, rebuttal, p. 62).

BST proposes average drop lengths of 325 feet for buried drop, and 250 feet for aerial drop. These figures are based on the opinions of subject matter experts, however, no supporting documentation was provided to justify them. BST proposes five-pair buried drop be used for businesses and residences (Wells, rebuttal, p. 62)

UTSE's cost inputs are fixed, regardless of whether the drop is aerial or buried, urban or rural. The input costs for aerial drop proposed by UTSE are more than twice as high as AT&T or BST, which is "significant because...UTSE models 75-90% of its distribution plant as aerial (Wells, rebuttal, p. 51).

#### **Findings**

Consistent with the Phase I decision, the input values must be Tennessee-specific. Therefore, the Authority finds that both models shall include the per foot drop wire costs used by the HAI model. In addition, the BCPM model shall be adjusted to reflect a 100 foot input for aerial and buried drop length.

According to witnesses, the last nationwide study of loops was a BellCore study conducted in 1983-1985. It indicated that the national average drop length is 73 feet. Using this as a basis, the input of 100 feet gives a Tennessee-specific drop length that is reasonable. This finding is consistent with the Authority's decision in docket 97-001262 (permanent prices). Also, the drop costs of the HAI model are more realistic because they vary according to the type of drop (aerial or buried) and the location of drop (urban or rural). In contrast, the BCPM drop cost inputs as presented by BST do not vary for urban and rural areas, while UTSE's inputs do not vary at all, regardless of the type of drop or its location.

# 16e. What method should be used to determine structure sharing (e.g., poles, trenches, conduits)?

Structures such as utility poles, trenches, and conduits are often used by more than one utility. For instance, the same telephone pole may be used by the electric utility, cable company, CLECs as well as the ILEC. These utilities would share the cost of the provision and use of the pole.

#### **Positions of the Parties**

BST & UTSE both rely on the past experience of their respective companies to determine the level of structure sharing that will occur on a forward looking basis. UTSE witness Laemmli and BST witness Caldwell both admit that their company's inputs into the BCPM are based on company-specific values, most of which are based on "actual experience." Supporters of BCPM argue that the level of sharing is unlikely to increase in the future. BST witness Martin asserts that the level of sharing to be input in their BCPM model is "representative of what an efficient provider could expect to pay in a competitive environment."

The proponents of HAI argue that the level of sharing will likely increase in the future as more competitors entering the market are forced to utilize limited numbers of rights-of-way. AT&T/MCI point out that the inputs of the BCPM are not forward-looking and that the BCPM fails to take anticipated growth into account properly. AT&T and MCI recommend two (buried) or three (aerial) additional entities sharing the structures of the incumbent for most density zones.

#### **Findings**

For aerial support structures, the models shall reflect three other entities sharing the structure with the ILEC, for a total of four. For buried distribution structures, the models shall reflect one other entity sharing with the ILEC, for a total of two. The parties are to adjust their

models accordingly. These assumptions are reflective of a competitive environment where multiple providers exist.

As competition develops, the amount of structure sharing will certainly increase above current levels. The inputs proposed by BST and UTSE fail to recognize this point. While AT&T/MCI's input for aerial structures reasonably reflects the increasingly competitive environment, they did not demonstrate that their structure sharing proposal for buried structures was realistic even where multiple competitors exist. This ruling is consistent with the Authority's ruling in the permanent prices docket.

Note: The following three issues (16f, 16g, and 16h) all relate to the loop design standards and associated inputs to be used in the models. Much of the evidence presented by the parties is applicable to all three issues. Therefore, for purposes of this order, these issues will be combined.

Issue 16f: What method should be used to determine the most economically efficient fiber-copper crossover point?

Issue 16g: What loop design standards, if any, should be adopted for the cost model?

Issue 16h: What size(s) of digital loop carriers should the model incorporate?

#### **Positions of the Parties**

These three issues concern the algorithm that determines whether fiber facilities are used instead of copper facilities in the feeder portion of the loop. Copper cable is more expensive (per foot) to deploy than fiber cable, but fiber feeder requires installation of costly Digital Loop Carrier ("DLC") equipment. Therefore for short distances, fiber feeder tends to cost more than copper feeder. For distances beyond a certain threshold, however, the cost of fiber feeder with the necessary DLC equipment is less than comparable copper facilities. <sup>10</sup> The loop design standards

<sup>&</sup>lt;sup>10</sup> A DLC is placed between the customer's premises and the local telephone office, and reduces the distance over which an analog voice frequency signal must travel.

adopted in these proceedings will determine the number and size of DLCs which must be used to meet Universal Service requirements. This in turn affects loop costs.

The models' sponsors suggest different methods of determining whether copper or fiber facilities should be used in the feeder. BST and UTSE propose the BCPM's default method based on total loop length. AT&T and MCI recommend the HAI's default method, whereby fiber feeder facilities are exchanged for copper facilities if any one of several predetermined criteria are met. One of the HAI's criteria is based on total loop length.

The BCPM model sets a target of 12,000 feet for copper connections between a DLC remote terminal and a customer's premises. The HAI model, as proposed by AT&T and MCI, allows for copper loops to be utilized out to 18,000 feet from a DLC remote terminal. <sup>11</sup> Thus, the HAI approach reduces the number of DLCs required by utilizing larger carrier systems with longer loops.

BST and UTSE recommend the BCPM's default value of the threshold total loop length (feeder plus distribution) that determines whether copper or fiber facilities are used in the feeder. By default, the BCPM deploys fiber feeder if the loop length for any customer served by the "ultimate grid" exceeds 12,000 feet (BCPM Model Methodology, Section 6.6). BST contends that a network comprised of a majority of loops in excess of 12,000 feet, as the HAI proposes, results in a degradation of voice grade services and prohibits access to advanced telecommunications services for customers served by these loops. 12

<sup>&</sup>lt;sup>11</sup> Both the BCPM and HAI 5.0(a) models use Carrier Serving Areas (CSAs) in their loop design. The CSA concept was conceived to deal with the evolution to a network that can readily provide digital services via loop facilities. The CSA is a specific geographic area that can be served by a single Digital Loop Carrier (DLC) Remote Terminal.

<sup>&</sup>lt;sup>12</sup> BST Witness Bowman defined advanced services as capable of transmitting data at 28.8kbps. (Transcript Volume 1, page 275).

AT&T and MCI recommend the default approach used in the HAI. The Distribution Module of the HAI calculates all of the outside plant distances to determine the type of cable required for the various loop components. In all cases, the HAI uses copper distribution cable to connect service area interfaces (SAIs) to customer premises. The HAI locates the SAIs to ensure that the feeder and distribution cable lengths do not exceed the (user-adjustable) maximum "analog copper length" of 18,000 feet. By default, the HAI selects fiber feeder if any of the following four criteria are met: (1) the total feeder and subfeeder distance from the wire center to the main cluster centroid exceeds the user-adjustable Copper Feeder Max Distance of 9,000 feet; (2) the total copper loop length, including feeder and distribution cable, from the wire center to the farthest corner of a main cluster, exceeds the user-adjustable maximum analog copper length of 18,000 feet; (3) a life-cycle cost comparison of fiber versus copper feeder on the particular route shows that fiber is more economical; or (4) there is at least one outlier cluster subtending the main cluster (Wood Direct, p. 31, Exh. DJW-2, pp. 19-21, 45-46).

AT&T contends that the loop designs of the HAI model are "fully capable of accommodating all manner of advanced services, including traditional analog modem and high speed ISDN." (Wood, Direct 10-11) According to AT&T, the HAI accomplishes this by incorporating "T-1 technologies in place of the coarse gauge cable and load coils utilized in embedded networks and extended range cards when necessary." (Wood Direct p. 10)

The parties also disagree on the type of range extension cards needed in the BCPM model. AT&T, MCI and UTSE recommend the RUVG2 range extension card while BST advocates the REUVG card. According to AT&T, the REUVG card costs approximately forty percent more than the RUVG2 card, yet it is comparable in service quality.

#### **Findings**

The Authority finds that the fiber/copper break point in the BCPM model shall be increased from 12,000 feet to 18,000 feet and that the number and capacity of DLCs shall be adjusted to reflect this change in the break point.

The HAI approach to fiber plant deployment through criteria in addition to loop length appears to be the more consistent with the estimation of forward-looking, economic costs of loop technologies. The Authority finds that the "T-1 technology" advocated by the HAI sponsors enables quality voice and advanced telecommunications services on copper loops up to 18,000 feet in length.

The Universal Service Joint Board drew a similar conclusion in its recommendations to the FCC for the interstate Universal Service Fund. In its Fifth Report and Order in FCC Docket 96-45, the Joint Board found that "a platform that uses 18,000 foot loop lengths will support at appropriate quality levels, the services eligible for universal service support" (paragraph 86).

The Authority also finds that BCPM shall be adjusted to include the RUVG2 range extension card in place of the REUVG card. According to the testimony of BST witness Bowman, either line card is acceptable under the respective manufacturer's standards. BST failed to show that the less expensive RUVG2 card will result in inferior service quality, or in any other way justify the expense associated with the REUVG card.

#### 16i. What wireless threshold, if any, should the model use?

This issue was raised to receive input from the parties on the use of alternative technologies to provide universal service in rural areas, and whether there is a loop length or cost of providing telephone service in Tennessee by traditional means that should trigger the use of alternative technology.

#### Position of the Parties

UTSE testified that until the alternative cost of wireless technology can be determined with a greater degree of accuracy, the Authority should not adopt a cap. BST included the BCPM's \$10,000 investment threshold as a "wireless cap." However, BST witnesses did not explain how the cap was determined.

Finally, AT&T/MCI witness Wood testified that the HAI model as proposed does not calculate a wireless threshold and that such a threshold is not necessary.

#### **Findings**

No convincing evidence was presented to demonstrate the need for a "wireless threshold" in Tennessee. Therefore, the Authority adopts no wireless threshold in this proceeding.

16j. What method should be used to determine the materials and installation costs of manholes, poles, anchors, guys, aerial cable, and building attachments?

#### **Position of the Parties**

BST testified that it used cable costs for both copper and fiber cable which reflect BST-specific cable costs in Tennessee. Material prices for copper and fiber cable are based on actual prices paid by BST and are adjusted for inflation. (Caldwell Direct, p.9-10).

BST's contractor costs for structure placement is based on a straight average of the four existing BST contracts with outside plant contractors in Tennessee. These four contracts cover the entire BST territory in Tennessee. BST also used BST-specific inputs from these contracts for the costs of manholes in Tennessee. (Caldwell Direct, p. 8-9). Similar to BST, UTSE also uses actual costs to develop its structure placement costs.

Sponsors of the HAI model testified that structure placement inputs were developed by contacting a variety of vendors for current cost estimates on installing manholes, poles, anchors, guys, aerial cable, and building attachments. Both AT&T witness Wells (Direct, page 15) and

CAD witness Hickerson (Rebuttal, page 26) point out that the cost of poles proposed by BST and UTSE materially exceed cost estimates submitted to the FCC by these two companies.

#### **Findings**

The TRA determines that the HAI inputs be used for determining the cost of materials and installation costs of manholes, poles, anchors, guys, aerial cable, and building attachments. The BCPM should be adjusted accordingly.

In determining the BCPM inputs, BST and UTSE did not verify its contractor cost estimates with outside vendors. Instead, the contractor cost of manholes, poles, anchors, guys, aerial cable, and building attachments are based on actual costs and may not be reflective of a forward looking economic cost methodology. In contrast to the BCPM, the HAI inputs utilized prices that were validated with up-to date price quotes from outside vendors and other ILEC data. The HAI prices reflect estimates of the costs of constructing an efficient network using existing technologies beginning with existing wire center locations. Thus, inputs are consistent with the estimation of forward looking economic costs.

16k. What method should be used to determine the cost of the Network Interface Device (NID)?

#### **Positions of the Parties**

BST uses historical company-specific costs for the material, travel and installation labor associated with installing the NID for use in the BCPM model. (Caldwell, direct, p.13). The total installation time proposed by BST is 35 minutes. UTSE advocates a similar approach for calculating NID costs.

Sponsors of the HAI model propose NID costs based on the cost of the case and protection block along with 25 minutes of installation time. The cost of the case and protector

were derived from price quotes from outside vendors. Unlike BST and UTSE, HAI sponsors propose separate NID costs for residential and business customers.

#### **Findings**

The Authority adopts the HAI inputs for calculating the cost of the NID. The most significant differences between the inputs proposed by the BCPM sponsors and the inputs proposed by the HAI sponsors are the labor costs related to the time needed to install the NID. The HAI model assumes ten fewer minutes to install the NID. The time of installation proposed by the HAI sponsors assume that more than one NID is installed during a single trip. Rather than forward looking costs, BST used historical, company specific costs for their material, travel and installation labor associated with NID installations. The Authority finds that the HAI approach is more reflective of forward looking economic cost methodology. Therefore, the BCPM should be amended to include the NID costs included in the HAI model as presented to the Authority.

# 16l. What method should be used to determine the cost of investment and installation of service area interfaces (SAI)?

#### **Position of the Parties**

BST and UTSE contend that company-specific inputs based on actual costs should be used to determine the cost of investment and installation of SAIs. Material prices should be based on actual prices paid to vendors, adjusted for vendor discounts and inflation. Engineering and labor costs should be developed from Tennessee-specific operations. AT&T and MCI maintain that the HAI default values for SAI investment should be used. The SAI investment is determined through the HAI Inputs Portfolio, which is designed to estimate efficient costs in a competitive environment. The estimate is computed based upon responses to inquiries about the type and amount of material and labor needed to construct an SAI.

#### **Findings**

The Authority finds that the HAI inputs shall be used in both models for determining the cost of installing SAIs and that the BCPM shall be adjusted accordingly. The HAI's cost estimates of the materials and labor needed to install SAIs more accurately reflects the forward looking, least cost approach adopted by the Authority in this proceeding. BST's costs for comparable SAIs are up to four times higher than UTSE's. As shown by Exhibit JWW4, p. 21, the BCPM BST-Tennessee's (indoor) SAI cost of a 4200 density Zone is \$117,074, compared to UTSE's (indoor) SAI cost of \$23,362. This significant disparity between BST's and UTSE's costs for comparable SAI's was not substantiated by BST and therefore should be rejected.

#### 16m. What method should be used to determine cable fill and utilization factors?

#### **Position of the Parties**

UTSE testified that fill factors in the BCPM model were based on actual 1997 UTSE experience in Tennessee. UTSE justified the provisioning of service to unoccupied households and employing a 50% distribution factor by stating that construction costs to later deploy service are expensive and an inconvenience to customers.

BST contends that the cable and fiber fill are the inputs that have the most significant impact on the results of the BCPM. BST states that the BCPM determines the network required to provide quality service to an area, calculates the cost of that network, and then determines a cost per line based on the number of lines served by the network. Thus, the BCPM uses an average of the actual utilization to determine universal service costs, and these cable sizing factors are designed to produce a fill equal to BST's projection of actual fill, based on historical experience in Tennessee.

AT&T contends that the BCPM requires an excessive amount of spare distribution cable pairs because this model over-estimates the number of requisite distribution cables by: 1) sizing for the maximum demand by allocating two cable pairs to all houses; 2) increasing the ultimate number of pairs required by a cable sizing factor; and 3) finally rounding up this double inflated pair requirement to the next largest discrete cable size.

AT&T and MCI state that the HAI Model considers cable distribution fill through the cable sizing factor. Distribution and Copper Feeder Cable Sizing Factors are the factors by which distribution and feeder are increased above the size needed to serve a given quantity of demand in order to provide spare pairs for breakage, line administration, and a certain amount of growth. The HAI Model divides the number of pairs needed in a distribution and feeder cable to meet existing demand by this factor to determine the number of pairs required, then uses the next larger available cable size. Both AT&T and MCI believe that the HAI appropriately models lower fill factors in rural areas because of generally smaller cable sizes. Conversely, the BCPM and the ILECs do not show any variation by density zone. Thus, the fill factors in the HAI Model more reasonably estimate the appropriate cable size by the density zone with more than sufficient spare capacity.

BST advanced the position of the Georgetown Group, who evaluated the reasonableness of the HAI application by focusing on the nature and quality of the inputs selected by MCI and AT&T. The Georgetown Group suggested that the HAI application is not reasonable for use in this case because the default values selected by MCI and AT&T for sensitive user adjustable inputs do not meet the requirements of reflecting the conditions of BST's territory in Tennessee as well as being reasonable and forward-looking.

#### **Findings**

The Authority orders no adjustments to the fill and utilization factors used in the models. Although the BCPM and the HAI models determine fill/utilization for distribution and feeder in a different manner, the Authority finds that neither the BCPM or HAI model requires a vast change in operation.

The fill and utilization factors do not appear to be user adjustable inputs in either model. Instead, fill and utilization are outputs derived from various other inputs and calculations inherent in the models. Therefore, the Authority will analyze, to the extent necessary, the fill and utilization outputs in future deliberations when deciding if one model should be selected over the other.

- 16n. What method should be used to determine the mix of host, stand-alone, and remote switches?
- 160. What switch capacity constraints, if any, should the model employ?
- 16p. What method should be used to determine switching investment costs?

#### **Positions of the Parties**

To determine switching investment costs, BST and UTSE advocate using the BCPM's Switching Module. The Switching Module's estimation process first compiles the company's switch-specific data inputs, including switch location, type, and capacity. BST and UTSE recommend using the BCPM defaults based on Common Language Location Identifier ("CLLI") data for their respective serving areas as provided by Bellcore's Local Exchange Routing Guide ("LERG"). This data indicates whether any given switch is a host, remote or stand-alone, thereby determining the company's mix of types of switches (Issue 16n). UTSE justified its estimates based on its embedded switch network on grounds that UTSE performs, on an ongoing basis,

significant network planning, economic analysis and redesign of its switch network in Tennessee.<sup>13</sup>

The only two types of switch models available under the BCPM design are the DMS-100 and the 5ESS. No BST or UTSE witnesses testified directly on this input, but according to their respective SW (switching) State Default Inputs tables, BST assumes a ratio of 59% 5ESS to 41% DMS-100, while UTSE assumes a ratio of 17% 5ESS to 83% DMS-100.

In the BCPM, adjustable inputs determine capacity constraints (Issue 16o), as well as corresponding levels of usage and fill for each CLLI switch. The BCPM limits switch capacity to 80,000 lines, 1,800,000 CCS of busy hour calls, and 600,000 busy hour call attempts ("BHCA") served by a switch. Both BST and UTSE recommend these switch capacity constraint values.

The BCPM determines the total switch investment cost associated with different categories of switch functionality, called "buckets," for each CLLI switch. Company-specific vendor discount factors are used to produce an "effective discount" level for each bucket, but the "effective discounts" as well as the underlying vendor discount information are considered proprietary by both BST and UTSE.

Next, the BCPM uses the investment estimates to calculate universal service switching investments for "units" of the different buckets. These unit investment costs are multiplied by the usage data corresponding to each bucket. These products are then averaged across either the switch, the rate center, or the host/remote complex, as appropriate, then investment loading factors<sup>14</sup> are applied.<sup>15</sup> The resulting averages represent installed investment per line, by bucket.

<sup>&</sup>lt;sup>13</sup> See UTSE Brief at p. 43.

<sup>&</sup>lt;sup>14</sup> These loading factors relate to the company's labor and material needed to install the switch, the necessary central office floor space, the installation of miscellaneous switch equipment like racks and bays, and sales tax. <sup>15</sup> See BCPM 3.0 Model Methodology, Section 7.

The summation of these averages across buckets produces a monthly switching cost per line (Issue 16p).

BST and UTSE use different methods of including the cost of vertical features in their respective estimates of monthly universal service switching costs per line. BST proposes standalone monthly costs for 23 vertical features, to be added to the monthly costs per line for residential lines as calculated by the BCPM. These proposed stand-alone costs for features are based on BST's UNE cost studies. BST's BCPM documentation states, however, that current demand data corresponding to features is not available. Meanwhile, UTSE witness Carl Laemmli states that UTSE made modifications to the BCPM to incorporate the switching costs associated with vertical features, to be added to the monthly costs for features are based on BST's UNE cost studies. BST's BCPM documentation states, however, that current demand data corresponding to features is not available. Meanwhile, UTSE witness Carl Laemmli states that UTSE made modifications to the BCPM to incorporate the switching costs associated with vertical features, to the failed to elaborate on these modifications or where they appear in the input data.

AT&T/MCI WorldCom witnesses Wood and Pitkin criticize the BCPM's Switching Module for being fundamentally based on the embedded network configurations. They also criticize the BCPM for not modeling the placement of switches smaller than the 5ESS or DMS-100 in small wire centers that could be served by smaller switches like the DMS-10. Wood and Pitkin also state that the BCPM inappropriately assigns getting started investment to the processor. 19

AT&T and MCI recommend the Switching and Interoffice Module of the HAI for calculating switching and wire center investment costs. According to the Model Description,<sup>20</sup> for each wire center the input data in this module include calling volumes from ARMIS reports,

<sup>&</sup>lt;sup>16</sup> See BST BCPM documentation, at Bates Stamp Pages 7, 268, 278.

<sup>&</sup>lt;sup>17</sup> See Laemmli Direct, at p. 6; Phase II Tr. v. IIA, at p. 8.

<sup>&</sup>lt;sup>18</sup> See Wood/Pitkin Rebuttal, at pp. 30-32; Phase II Tr. v. IIA, at pp. 42-47.

<sup>19</sup> See Wood/Pitkin Rebuttal, at p. 88.

<sup>&</sup>lt;sup>20</sup> Wood Direct, Exh. DJW-2.

wire center locations from Bellcore's LERG, and line counts from the PNR database. For other inputs, this module also relies on traffic assumptions suggested in Bellcore documents and calling patterns from published Dial Equipment Minutes ("DEM") information.

The HAI documentation states that the model is capable of engineering and costing end office switching systems comprised of specific mixes of host remote and stand-alone switches (Issue 16n). Because accurate data on the purchase prices of host, remote, and stand-alone switches of varying capacities may not be available, the model defaults to input values for common equipment and average per line investments over an "efficient mixture" of switches within the modeled network.<sup>21</sup>

The HAI places at least one end office switch in each wire center, but may place more depending on estimated network usage. Like the BCPM, the HAI uses switch capacity constraints (Issue 160), based on the number of lines plus trunk ports, as well as the number (in BHCA units) and length (in BHCCS units) of busy hour call attempts. For these capacity constraints, AT&T and MCI recommend the HAI's default values. The HAI default total line capacity (including trunks) is 80,000, which is identical to the comparable BCPM constraint proposed by BST and UTSE. The other HAI default values vary according to the number of lines served by a switch. The HAI's default BHCA constraints range from 10,000 to 600,000, and the HAI's default BHCCS constraints range from 30,000 to 1,800,000.

Also like the BCPM, the HAI relies on separately developed switch curves to calculate switching costs. AT&T and MCI witnesses Wood and Pitkin testify that the projected costs generated by the switching cost curves used by the HAI are reasonable when compared to data filed with the FCC by the ILECs on the cost of purchasing switches.<sup>22</sup>

<sup>&</sup>lt;sup>21</sup> See Wood Direct, Exh. DJW-2, at pp. 57-58.
<sup>22</sup> See Wood/Pitkin Rebuttal, at pp. 33-34, fn. 17.

The HAI computes required wire center investments separately for each type of switch in the modeled network. For wire centers housing multiple end office switches, the wire center investment calculation adds switch rooms to house each additional switch. Wire center investments required to support end office and tandem switches are based on assumptions regarding the room size required to house a switch, construction costs, lot sizes, land acquisition costs as well as investment in power systems and distributing frames. For end offices, the room size varies according to the line size of the switch.

In calculating investment in switch engineering and installation activities, the HAI uses a mark-up of 10%. According to the HAI documentation, this factor was derived from information from 1992 ONA filings to the FCC (FCC Docket 92-91), in which Bell Atlantic showed a range of engineering mark-ups between 8.00% and 10.80%, and SBC showed a range of summed engineering and plant labor factors from 8.79% to 12.88%.<sup>23</sup>

BST's panel of witnesses from the Georgetown Consulting Group (the "GCG panel") suggested several modifications to the HAI inputs proposed by AT&T and MCI. In fact, the GCG panel identified 19 inputs for which it was able to obtain and suggest alternatives that "reflect forward-looking costs and other conditions based on BST-Tennessee data." However, the panel did not explain why the input values applied by AT&T and MCI are inappropriate, nor did the panel explain fully the standards, sources, or calculations used to derive their suggested alternatives.

Time Warner/TCTA stressed the importance of model inputs over model platforms (algorithms), and included the purchase price for switching facilities among the inputs that have

<sup>&</sup>lt;sup>23</sup> See Wood Direct, Exh. DJW-3, at p.75. <sup>24</sup> See Exh. CGC-13, at p. 1.

the most significant impact on the proposed models' estimates.<sup>25</sup> Neither the Coalition nor the Consumer Advocate commented directly on Issues 16n,o,p.

#### **Findings**

As with other issues concerning the appropriate overall cost methodology (e.g., Issues 16a and 16c), neither of the switching investment cost methodologies proposed by the parties is inherently unreasonable, yet at this time, neither is obviously superior.

Ideally, estimates of the switching costs should be based on documented actual switch vendor discounts, but the actual vendor discounts given to BST and UTSE are not available in the record. The HAI relies on estimates of switching cost factors which account for assumed vendor discounts. Meanwhile, BST and UTSE report "effective discounts" used by the BCPM, but these effective discounts combine the proprietary vendor discounts (which are applied to equipment only) with the vendors' labor and installation times. Further, the underlying studies that produced the effective discounts are not clearly documented in the record.

The Authority is not convinced by the GCG panel's testimony regarding appropriate input values for the switching cost component of the HAI. Nor does the GCG panel sufficiently explain why the inputs applied by AT&T and MCI are inappropriate or why their alternatives are appropriate.

Based on the record, the Authority finds that no changes should be made in either model with respect to Issues 16n and 16o. With respect to Issue 16p, in order to estimate universal service switch costs in a manner consistent with the Authority's decision regarding switch costs in Docket No. 97-01262:

1. BST and UTSE should adjust the BCPM by adjusting the "effective discounts" used in the BCPM's Switching Module to reflect vendor discounts on switching equipment equal to those ordered by the Authority

<sup>&</sup>lt;sup>25</sup> See Time Warner/TCTA Brief, at p. 2.

in Issue 14 of Phase I of Docket 97-01262. Likewise, AT&T and MCI should use these recommended discount levels where appropriate in the HAI.

- 2. BST should <u>not</u> include its proposed stand-alone costs for vertical features in its cost estimates.
- 3. UTSE should not perform the input changes originally used to allow the BCPM calculations to include the costs of vertical features.

#### 4. BST and UTSE should:

- a. use the switch curves derived from Bellcore's SCIS model:
- b. use the output from underlying SCIS calculations when SCIS/MO is run in its marginal mode; and
- c. recalculate switch usage charges per CCS as follows: First, subtract non-traffic sensitive line termination costs and getting started investments from total switch investments. Second, divide the resulting amount by the volume of busy hour calls measured in CCSs.

## 16q. What method should be used to determine the portion of total inter-office trunking, signaling, and local tandem costs to be attributed to universal service?

This question was asked to allow the parties to provide input to the Authority on the proper method or basis to use to allocate a portion

of inter-office trunking, signaling and local tandem costs to universal service. These are the costs that LECs incur to connect their switches together and to route traffic. BST, UTSE, and AT&T addressed this issue in testimony or Proposed Findings of Fact and Conclusions of Law in conjunction with issue 16p and discussion of how the BCPM and the HAI modeled the inter-office trunking, signaling and local tandem facilities.

#### **Positions of the Parties**

BST, at page 42 of its Proposed Findings of Fact and Conclusions of Law, stated that the method to be used to determine the portion of the costs to be attributed to universal service should be based on the amount of local traffic which uses these components of the network. Further, BST states that the percentages of inter-office minutes of use for extended area service

("EAS") determines the interoffice cost attributed to universal service in the BCPM model. BST also states that the BCPM uses an inter-office transport module which determines inter-office costs using Synchronous Optical Network ("SONET") ring architectures. Inputs to this module are BST specific costs for Tennessee including fill factors, SONET material prices, number of nodes to a ring, air-to-route factor, as well as the mix of aerial, underground and buried fiber in the inter-office transport. Total signaling costs are calculated based on signaling investment per line inputs. According to BST witness Caldwell, after reviewing the default inputs and finding these to be reasonable, BST decided to use these values (Transcript, Volume IIA, p. 85). The input in the switching model SS 7 Usage Attributable to Basic Calls determines the amount of total signaling costs which is attributed to universal service.

BST witness Caldwell provided brief testimony on this issue referencing BCPM interoffice transport module (Caldwell Direct, p. 12). Section 8.0 of the BCPM documentation provides the assumptions, inputs, building, costing of the SONET ring. In its Proposed Findings of Fact and Conclusions of Law, and in its brief at page 44, BST also references its input factors in "Bates Stamp" pages 247, 253 and 259 of the BCPM documentation.

UTSE, in its Proposed Findings of Fact and Conclusions of Law at page 32, generally describes how the BCPM develops the investment in inter-office transport facilities necessary to provide services that will be supported by the Universal Service Fund. UTSE points out how the inputs were developed from data relating to its Tennessee operations included in the 1996 ARMIS Report. The actual route miles were taken from the most recently available network maps and databases. The host/remote access line-to-trunk factors were developed from the most currently available company-specific line and trunk databases. The EAS factor was set at 100% to include certain transport costs associated with the revenue benchmark as determined by the

Authority. UTSE proposes that the Authority find that UTSE's inputs for inter-office trunking, signaling and local tandem costs are appropriate for Tennessee universal service cost determinations, per the direct testimony of its witness Laemmli pages 6-14. In its November 14, 1997, response to Issue 16q, UTSE references the "Transport" chapter, pages 66-75 in the Model Methodology document, as it only response.

AT&T, in its Proposed Findings of Fact and Conclusions of Law at page 37, grouped its response to Issues 16p and 16q together. AT&T states that the Switching and Inter-office Module of the HAI Model computes investments for end office switching, as well as computing investments for signaling and inter-office transmission facilities. The user of the Model can designate specific wire center locations that house host, remote, and stand-alone switches, respectively, as well as specify inputs for the per-line investments associated with each type of switch. The Switching Module determines the required capacity and distances of inter-office transmission facilities, using the traffic data and the inter-office distances that are inputs to the Module. In doing so, it uses wire center locations and inter-office distances to determine the efficient mix of inter-office SONET fiber rings and redundant point-to-point fiber links. AT&T notes that the numbers and types of elements involved can be examined in the intermediate outputs of the Switching and Inter-office Module as recorded in the workfile.

AT&T's Proposed Findings of Fact and Conclusions of Law criticizes the BCPM because it relies on either Bellcore's SCIS model or US West's SCM model to determine switch costs. AT&T states that the BCPM relies on proprietary algorithms and inputs to Bellcore's or US West's models to functionally categorize switching investment data into "buckets." Further, AT&T contends that the SCIS and SCM input processes to the BCPM switching module are highly complex and extremely sensitive to the ILEC-designated inputs, which are unknown and

undocumented (Wood/Pitkin Rebuttal page 33-34). AT&T's proposed conclusion of law is that the HAI's method for determining switching investment and the portion of total inter-office trunking, signaling, and local tandem costs to be attributed to universal service is consistent with a least cost, most efficient, forward looking network and should be adopted in Tennessee.

#### **Findings**

No adjustments to the models should be made for inter-office trunking, signaling and local tandem costs at this time. The only proposal to determine the portion of total inter-office trunking, signaling, and local tandem costs to be attributed to universal service comes from BST's Proposed Findings of Fact and Conclusions of Law. BST witness Caldwell did not specifically make such findings. Direct testimony offered on the issue by Mr. Wood and Ms. Caldwell is brief and generally refers to the respective models that they support. Documents that substantiate the models discuss how the inter-office trunking, signaling, local tandem and SONET rings are designed, as well as the assumptions, inputs, defaults, etc. inherent in each model.

UTSE's witness Laemmli does not address the specific issue in his direct testimony. He generally discusses how UTSE used the BCPM Model and UTSE specific inputs for the investment in switching equipment, inputs for signaling investment, and inputs for determining investment in inter-office transport facilities. On page 12 of his direct, Mr. Laemmli states that UTSE's model uses information included in the state default input tables to determine the portion of switching equipment costs that are required to provide the services that will be supported by a universal service fund. No elaboration upon how this apportionment was made, or its basis, was offered.

It is incumbent upon the parties to respond to the issues presented by the Authority in a clear and concise manner. Only BST offered such an answer in its Proposed Findings of Fact and

Conclusions of Law. No party placed much emphasis on the issue and none clearly addressed it in testimony.

The Authority has decided in Phase I (Issue 9) that the revenue benchmark should include all revenues from basic local service (which would include any extended area service) toll service, directory assistance, all vertical features, touch tone, zone charges, long distance access (intrastate/interstate), the interstate Subscriber Line Charge, and white and yellow page revenues. Therefore, there is no need to allocate inter-office trunking, signaling and local tandem costs.

16r. What method should be used to determine costs of general support facilities (e.g., vehicles, land, buildings)?

#### **Position of the Parties**

BST used company-specific land and building loading factors which reflect the relationship between central office investment and its associated land and building investments as they occur in Tennessee. Since these factors are calculated from BST's accounting records and the projected view of BST's future additions in these accounts, BST contends these values reflect land and building costs that an efficient provider would be able to expect to achieve on a going forward basis (Caldwell Direct, pp. 13-14).

UTSE contends that company specific inputs should be used. UTSE developed costs for general support facilities used in Tennessee based on UTSE's current actual costs --- the actual costs incurred in support of its Tennessee operations (Tr. Vol IIA, pp. 6-16, 24, 76).

The HAI model calculates investments for furniture, office equipment, general purpose computers, buildings, motor vehicles, garage and other work equipment, and uses actual 1996 company investments to determine the ratio of these investments to total investment. The ratio is then multiplied by the network investment estimated by the model to produce the investment in general support equipment. The recurring costs (capital carrying costs and operating expenses) of

these items are then calculated from the investments in the same fashion as the recurring costs for other network components.

The CAD states that it appears that BST has used an embedded approach by relating historic investment in central office equipment with the related land and buildings investments without presenting any analysis to show that such a relationship is appropriate on a forward looking basis (Hickerson Rebuttal, p. 21).

#### **Findings**

In determining the costs of general support facilities (e.g., vehicles, land, and buildings), both approaches are similar and reasonable. Therefore, the Authority does not adopt one method over the other. No changes to the inputs of either model for general support facilities are required at this time.

# 16s. What method should be used to determine the economic depreciation rate of assets? Position of the Parties

BST and UTSE advocate the use of the depreciation rates used for financial reporting purposes. TCTA, AT&T/MCI and the CAD support the inclusion of inputs (lives, salvage values, etc.) used to develop the depreciation rates prescribed by the FCC and the Tennessee Public Service Commission (TPSC) in 1993 for BST and 1995 for UTSE. They contend that the prescribed rates are Tennessee specific, reflect forward looking investment and have been approved by both state and federal regulators. BST and UTSE contend that prescribed rates are not reflective of current market conditions or technology and should not be used.

#### **Findings**

In the cost models, it is not appropriate to use the same depreciation rates that are used in financial statements, because the financial statement depreciation rates are designed to report

financial results to present and future stockholders, and consistent with accounting principles, such depreciation rates are generally conservative in nature and not suitable for use in economic cost models. Typically, these rates are not appropriate for rate setting purposes.

Consistent with the Authority's decision in Docket 97-01262, Permanent Prices, the economic depreciation rates and associated inputs prescribed by the FCC and the TPSC in 1993 shall be included in both cost models. Because the prescribed rates are Tennesssee specific and reflect forward-looking technologies, they represent a reasonable recovery method for capital investment in Tennessee.

16t. What method should be used to determine plant specific (e.g. equipment and maintenance), non-plant specific (e.g. engineering network operations), customer service (e.g. marketing and billing), and corporate (e.g. legal and accounting) expense factors?

#### **Positions of the Parties**

In support of the HAI Model, AT&T witness Wood testified that the two major categories under which network-related expenses are reported by the ILECs are plant specific operations expenses and non-plant specific operations expenses. Certain expenses, particularly those for network maintenance, are functions of their associated capital investments. The Expense Module estimates these from historical expense ratios which are calculated from balance sheet and expense account information reported in each carrier's ARMIS report (Wood Direct, pp. 46-47).

To produce a forward looking estimate, in its November 14, 1997 response to Issue 16, AT&T stated that the Expense Module computes this expense as a per line additive value based on: the reported total Network Operations expense, divided by the number of access lines, minus 50 percent of the resulting quotient (Wood Direct, pp. 46-47).

AT&T Witness Lerma argues that BST estimates do not reflect improvements in technology, productivity gains, or the downward pressure on prices from competition. Mr.

Lerma states that he has similar concerns with UTSE's expense inputs, and that UTSE has not removed any non-recurring expenses from its calculation of basic service costs. Mr. Lerma adjusted the proposed expenses of BST by decreasing marketing expenses by 20%. He reasons that 20% of marketing expenses are advertising and that BST does not advertise basic service. He proposes a 27% reduction in overhead expenses, a reduction of the base year network operating expenses by 50%, and the removal of inflation adjustments to all operating expense accounts. Even with those proposed adjustments, Mr. Lerma stated that he would not recommend the expenses as revised, but instead would recommend the expenses proposed by the HAI Model as discussed by Mr. Wood (Lerma Rebuttal at p.15).

expenses. These expenses are considered to be causally related to investment and are developed from three years of projected expense and investment data. The result is an expense per dollar of investment for these plant-specific expense accounts. The plant-specific expense percentages used in the BST universal service study are identical to those used in the unbundled network element cost studies. She testified that non-plant specific expenses, such as Network Operations and Executive and Planning are not causally related to investment. These expenses are determined on a per line, per month basis using projected forward looking expenses and projected numbers of lines to derive an expense per line (Caldwell Direct pp. 16-17). Her testimony generally echoed BST's November 14, 1997, response to Issue 16 which stated that it is a large efficient provider of telecommunications services in Tennessee. Thus, BST specific expenses reflect economies of scale that a large, efficient provider would be expected to achieve on a going forward basis in Tennessee (BST's response to TRA Information Request dated October 31, 1997, Phase II, Issue No. 16 p. 7).

UTSE witness Laemmli stated that UTSE's cost study inputs were developed to produce an appraisal of the probable future costs of providing telecommunications services in the individual Tennessee locations served by UTSE. He reasoned that since the primary purpose of the cost model is to identify the cost of providing supported services to a specific geographic area, wherever possible, the cost inputs were developed from United's operational experience in Tennessee. When company specific information was not available, industry average cost information developed by BCPM sponsors was used if UTSE believed it to be consistent with its experience in Tennessee (Laemmli Direct at p.7).

#### **Findings**

The Authority finds that its decision in this matter should be consistent with its decision in the Permanent Prices, Docket No. 97-01262, Issue 7. Specifically the Authority finds that BST and UTSE should reduce the 1996 normalized Network Operations Expenses in the BCPM Model by 22.5%.

We are not convinced by AT&T's argument that network operations expenses should be reduced by 50%. While this reduction may have occurred in the past, AT&T provided no convincing evidence that similar cost reductions will be experienced on a going-forward basis. The Authority finds that the 7% annual productivity reduction for three years for a total of 22.5% should be applied to 1996 normalized network operations expenses of BST and UTSE in the BCPM Model. The resulting adjustment reflects a reasonable level of expenses for a forward looking cost model.

- 16u. In which cases is it appropriate to allocate costs between the provision of universal service and all other services?
- 16v. In cases where it is appropriate, what method should be used to allocate costs between the provision of universal service and all other services?

According to BST, since the BCPM is designed to determine only the cost of providing basic local exchange service, there is no need to allocate costs between universal service and other services (BST Brief, p. 47). Therefore, BST states this issue is not applicable, since no allocation of costs is necessary (BST brief, p. 47).

UTSE presented additional cost studies in order to provide a proper matching of revenues and costs in Exhibit CSP-1 of Parrott Direct and so no additional cost allocations are necessary.

AT&T stated that the TRA correctly defined the revenue benchmark in Phase I to include all services associated with loop and switch, and there is no need to allocate the cost of these facilities between universal service and other services.

#### **Findings**

These two issues are sufficiently addressed in the Phase I Order and no additional findings are necessary.

16w. What, if any, local usage component should be included in universal service support?

#### **Findings**

Cost studies should include all local usage since the revenue benchmark includes all residential services as determined in the Phase I Order. Both models should be adjusted accordingly.

## 16x. What is the proper cost and percentage of equity?

The parties agreed to the entry of AT&T and MCI witness Hirshleifer's and BST witness Billingsley's testimony into the record without cross-examination provided that the cross-

examination of these witnesses from the transcript of the Permanent Prices hearing (Docket 97-01262) was also admitted into the record. As this testimony and cross-examination therefore became part of the record in this proceeding (Tr., Vol. I-E, pp. 258-9), reference in the following section is made to the relevant portions of the Permanent Prices transcript.

#### **Positions of the Parties**

Three components comprise the overall cost of capital: cost of equity, cost of debt, and capital structure. AT&T and MCI's witness Hershleifer testified that the best proxy group of firms to use in estimating the cost of equity for a wholesale UNE provider consists of existing local exchange companies. In contrast, BST witness Billingsley's estimates of the cost of equity rely on a comparison group of firms selected from the general economy and not from incumbent local exchange companies. Hirshleifer also presents a non-constant growth DCF model, while Billingsley advocates a constant growth DCF model with adjustments for quarterly payment of dividends and flotation costs. Hirshleifer's DCF and CAPM estimates are both dependent on his non-constant growth DCF formula. Hirshleifer and Billingsley essentially agree that a capital structure of 40% debt and 60% equity is reasonable for both BST and UTSE.

#### **Findings**

The Authority finds that the best proxy group of firms for a wholesale UNE provider consists of existing local exchange companies suggested by Hirshleifer. The Authority also finds that the constant growth DCF model used by Billingsley, without his adjustments for quarterly payment of dividends and flotation costs, should be utilized. The Authority thus adopts a cost of equity of 12.46% for use in all cost models estimating universal service costs for both BST and UTSE. This percentage is derived by applying the unadjusted constant-growth DCF formula to

<sup>&</sup>lt;sup>26</sup> See Transcript of Hearing, Docket 97-01262, Vol. VIII D, at pp. 242-243.

the data on telephone companies provided by Hirshleifer. (Attachment JH-4). The mixing of Hirshleifer's firms with Billingsley's formula should be acceptable, since both Billingsley and Hirshleifer stated that there was no relationship between the selection of firms and the models/formulas to be applied.<sup>27</sup>

Since the record contains no independent testimony on the cost of equity for UTSE, the Authority adopts the same cost of equity for both companies. This is appropriate in any event for non-company-specific, generic cost studies, and especially for capital inputs whose costs are determined in markets that are, at a minimum, national in scope.

The Authority adopts an equity percentage of 60% for use in both models for estimating the costs of BST as well as UTSE.

### 16y. What is the proper cost of debt?

#### **Positions of the Parties**

For AT&T and MCI, Hirshleifer calculates BST's and UTSE's costs of debt at a point in time (December 31, 1996). For BST, Billingsley abstracts from BST by applying a longer term relationship (the historical spread between AAA utility bonds and U. S. Treasury bonds) to a more current cost indicator (average T-bond yield for December 1997-February 1998). Both witnesses agree that the capital markets are at least national in scope and not Tennessee specific.

#### **Findings**

In the Phase I Order, the TRA found that "the cost studies should use factors that reflect the forward-looking, least cost technology of an efficient firm operating in Tennessee. Wherever possible, these factors should be state specific with respect to the geographic, topographic, or demographic characteristics of a local service provider's territory at the wire center level. These

<sup>&</sup>lt;sup>27</sup> See Transcript of Hearing, Docket 97- 01262, Vol. III D, at pp. 276-77 and Vol. VIII, at pp. 245-246.

factors do not necessarily have to represent the company-specific operating practices of the local service provider."<sup>28</sup> Otherwise, the cost studies are to be generic and portable.<sup>29</sup>

On this basis, Billingsley's 6.68% cost of debt is more generic and forward-looking than Hirshleifer's. The Authority adopts 6.68% as the cost of debt to be used by both models in estimating costs for BST. This results in an overall cost of capital of 10.15% for BST.

For UTSE's cost of debt, the Authority finds Billingsley's cost of debt analysis generic in nature, forward-looking, and a better fit for the characteristics of cost factors ordered in Phase I. Indeed, all parties agree that the capital markets are at least national in scope and not Tennessee specific. When not Tennessee specific, the cost studies are to be generic.

Nevertheless, there is no testimony specifically relating Billingsley's recommendation to UTSE. While Billingsley's focus is on testing the 11.25% cost of capital used by BST (also the cost of capital used by UTSE), his debt cost methodology is generic and not company specific. The only specific recommendation for UTSE's cost of debt is Hirshleifer's which is unrebutted in a narrow sense; however, Billingley does rebut Hirshleifer's general approach. Thus, even though Billingsley made no specific recommendation for UTSE, the Authority prefers Billingsley's generic method to Hirshleifer's company-specific approach.

For these reasons, the Authority adopts Billingsley's 6.68% cost of debt for UTSE, which yields an overall cost of capital of 10.15% for UTSE.

<sup>&</sup>lt;sup>28</sup> See Phase I Order, at p. 41.

<sup>&</sup>lt;sup>29</sup> See Phase I Order, at p. 40.

#### 17a. What is the cost of universal service?

## 17b. What should be the amount of support in a Tennessee Universal Service support system?

#### **Findings**

These issues were partially decided in the Phase I order, while the remainder have been addressed in Issue 8c of this proceeding. Page 8 of the Phase I order states that "if costs exceed the benchmark for the wire center, the difference less any federal support will be funded through the intrastate USF." The order, however, does not address situations where wire centers are providing a geographic "subsidy", i.e., where the revenue benchmark exceeds the economic costs for the wire center. This part of the issue is addressed in detail in Issue 8c of this order.

### 17c. What should be the Tennessee specific revenue benchmark?

## 17d. How should cost be related to the revenue benchmark and rates determined?

These two issues were addressed in the Phase I order.

Page 36 of the Phase I order states that:

The Authority finds that the revenue benchmark used in calculating support for each wire center should be the average revenue per residential line for that wire center. The average revenue should be calculated using the following services: basic local service, toll, directory assistance, all vertical features, touchtone, zone charges, long distance access (intrastate/interstate), the interstate Subscriber Line charge, and white page services. In addition, the subsidy provided by Yellow Page advertising should be included in the revenue benchmark.

The Phase I order goes on to state on page 41 that:

"The Authority also finds that the cost studies should include the network components needed to provide all of the services in the revenue benchmark. At a minimum, the entire loop and port and reasonable allocations of switching costs, tandem switching, transport and any software necessary to provide the services in the revenue benchmark must be included in calculating the forward looking costs for each wire center."

No additional findings are warranted.

## 17e. How will contracts between LECs be treated?

#### **Findings**

This issue is deferred until the Authority conducts a Universal Service proceeding for rural local exchange carriers. This Universal Service proceeding addresses the state's non-rural carriers, BST and UTSE. Therefore, it is not necessary to address this issue in this proceeding.

- 18. During the transition period should rates be rebalanced? If so, how?
- 18a. How will the TRA handle financial effects on carriers who have been providing support to existing systems?

In its Interim Order of May 20, 1998, the TRA ruled that after the total amount of Universal Service support is initially determined, the affected companies should file proposals to rebalance rates, including a plan to collect the resulting final support needed for Universal Service. Rate rebalancing is required under Tenn. Code Ann. § 65-5-207(c); specifically, this section states that if the Authority creates an alternative universal support mechanism, it shall:

Determine the financial effect on each universal service provider caused by the creation or a modification of the universal service support mechanism, and rebalance the effect through a one-time adjustment of equal amount to the rates of that provider.

#### **Positions of the Parties**

BST maintains that rates do not need to be rebalanced during the transition period. (BST Findings of Fact and Conclusions of Law, p. 50). BST states that basic residential rates will not need to be rebalanced if the fund is correctly sized, based on the benchmark BST proposed back in Phase I. Furthermore, BST asserts that funding for the universal service fund may be achieved by an end user surcharge or through the rates of the carriers (Transcript, Vol III A, pp. 30 - 31, Martin).

UTSE states that Phase III of this docket will address the net financial impacts to carriers and the associated rate rebalancing proposals. Any need for a transition period can be determined at that time. (UTSE Findings of Fact and Conclusion of Law, pp. 44 - 45). MCI states that if rates are reduced to remove the existing subsidies, then the TRA should recalculate the benchmark to recognize that action. MCI is concerned that failure to account for all of the current subsidy revenues would be a discriminatory, non-competitively neutral shift of ILEC

revenue requirements from one group of ILEC customers, the end users, to another group of ILEC customers, the IXCs (Hyde, rebuttal). AT&T states that because no intrastate fund is being recommended at this point, this issue is moot (Gillan, Direct, p. 20).

Time Warner and TCTA contend that the TRA should address this issue in Phase III. They opine that once the amount of the universal service support has been determined in Phase II, the services that have traditionally subsidized basic local service should be lowered equal to the amount of the universal service support. This will make the implicit support explicit (Comments filed April 2, 1998). If the universal service support system is designed and implemented properly, there will be no adverse financial effects with which to contend (Comments filed April 2, 1998).

The Coalition states that cost recovery shifts will need to be addressed in transition plans and any specific transition plan will depend on the degree of cost recovery shift. The speed at which rates can be readjusted or increased will depend on the amount of cost recovery shifts that may take place. The Coalition anticipates that very likely there could be a need for a transition period to moderate any substantial changes that occur as a result of decisions at the federal level and by the TRA in this and other proceedings.

#### **Findings**

This issue concerns funding of the universal service fund and any needed rate rebalancing. The size of the fund and method chosen to collect the funds directly correlate with any effects that carriers may experience from supporting the universal service fund. Therefore, a determination on transition to a new universal service support mechanism and its effect on carriers is premature at this time. In the next step of Phase II, the minimum size of the universal service fund will be determined. When the Authority enters Phase III of this proceeding, the amount will be known

and it will be appropriate to address funding, rate rebalancing and the effects on carriers. For these reasons, the Authority finds that all rate rebalancing issues and proposals will be considered during Phase III of the docket.

## 19. Should the TRA adopt new telephone quality of service standards?

TRA Rule Chapter 1220-4-2 outlines the minimum quality of service standards (hereafter referred to as "standards") for telephone companies in Tennessee. These standards are designed to ensure that telephone customers receive an adequate level of service. Telephone companies are required to file quarterly reports with the TRA so as to reveal whether the company is in compliance with the standards. The majority of the standards were established prior to the 1970.

#### **Positions of the Parties**

All companies commenting on this issue recommended that the TRA take no action on adopting new quality of service standards. Witnesses for BST, AT&T and UTSE cite the power of a competitive market to regulate telephone service quality: companies providing inferior service will be rejected by customers. BST maintains that consumers, not rules and regulations, will determine satisfactory service quality in a competitive market (Tr. Vol.III A, pp. 18-20). Likewise, AT&T asserts that a competitive local market will best determine the level of quality required for new entrants (Gillan, Dir. Att.A at 1).

#### **Findings**

The TRA's telephone service standards serve an important function by indicating the minimum level of service required to operate in Tennessee. Service standards were originally adopted by state regulatory agencies as a way to ensure that all citizens receive adequate telephone service. These rules were needed because market considerations (particularly profit motive) led telephone companies to make network deployment decisions that sometimes left rural

parts of their territories with inferior service compared to urban areas. Examples of this situation can be seen in the deployment of one-party service and central office equal access conversion. Customers in more urban areas generally received one-party service sooner than their more rural counterparts. Rural parts of Tennessee were also the last areas to see their telephone central offices converted to equal access. This latter example prevented rural customers from taking advantage of competition in the long distance market due to their inability to access more than one interlata carrier by dialing 1+.

All the parties in this proceeding who addressed this issue recommended that the TRA take no action. Their Findings suggests that the existing TRA rules are sufficient until competition emerges in Tennessee. However, the existing TRA service standards, which are of 1970's vintage, are not adequate to ensure that all Tennesseans receive the level of telephone service envisioned by the Telecommunications Act of 1996.

The positions of the parties all assume competitive local markets in Tennessee. While there is some competitive activity in Tennessee's local telecommunications markets, the markets cannot be considered "competitive" at this time. Local competition is not likely to be an adequate enforcer of service quality for the foreseeable future in Tennessee. Also, Section 254(b)3 of the Federal Act requires that "consumers in all regions of the Nation, including low-income consumers and those in rural, insular and high cost areas should have access to telecommunications and information services including interexchange services and advanced telecommunications and information services, that are reasonably comparable to those services provided in urban areas." The TRA's present telephone service standards are not adequate to ensure that all parts of the state receive telecommunications service in parity with areas where competition will emerge. For these reasons, especially with regard to information services, the

Authority finds that a rulemaking should be initiated for the purpose of establishing new telephone quality of service standards to replace Chapter 1220-4-2. This rulemaking would focus on services provided by all telecommunications providers to end user consumers.

- 20. How will the affordability of rates be monitored in the future?
  - a. Will the TRA want ongoing reports on subscribership levels, etc.?
  - b. Does the TRA need special procedures to hear complaints on affordability?

The most fundamental objective of U.S. telecommunications public policy since the 1930s has been universal service, a policy objective that all Americans have access to affordable telephone service. In its Phase I Order, the TRA cited the FCC's finding that "there is a correlation between subscribership and affordability" and that "States should monitor rates and non-rate factors, such as subscribership levels, to ensure affordability." Also in Phase I, the TRA ordered that "[a]ffordability of rates shall be monitored by the Authority through periodic evaluations of subscribership levels and associated market conditions such as average income levels, inflation and other socioeconomic factors" (TRA Interim Order of Phase I of Universal Service, at 30-31, 55). Thus, the focus of the question in Phase II is not whether or not the TRA will periodically monitor affordability, but rather how the TRA should monitor the affordability of rates in the future.

### Positions of the Parties

The parties commenting on this issue maintain that new measurements to evaluate the affordability of telephone rates are not needed in Tennessee. AT&T contends that the TRA utilize the household penetration studies conducted by the Federal Communications Commission ("FCC") to monitor subscribership levels in Tennessee (Martin, Direct at 19). BST asserts that the information provided by the FCC is sufficient to ensure that Tennessee's rates remain

affordable in the future (BST's Proposed Findings of Fact and Conclusions of Law, May 29, 1998, at 51).

#### **Findings**

The industry should work with the Authority to design a Tennessee-specific study to evaluate the penetration of telephone service in the state. Depending on the design of the study, the industry may be asked to provide ongoing company-specific reports on various aspects of subscribership. Further, the proposed study and associated costs shall be presented to the TRA for approval.

Also, the existing informal and formal complaint process of the TRA is adequate to address affordability complaints. Finally, the TRA's existing Lifeline and Link-up programs are sufficient to ensure affordable basic local telephone service for properly identified low-income consumers.

- 21. What should be the sources of support in a Tennessee Universal Service Support System?
  - a. What base will be used to determine amounts paid into the system for support of the Universal Service Fund?

#### **Position of the Parties**

BST maintains that assessments should be based upon interstate and intrastate retail end user revenues of intrastate telecommunications providers because this is the most competitively neutral way of assessing contributors. (Martin Direct, p. 21). BST contends that this method will result in a smaller contribution percentage against the revenues of all contributors. (Martin Direct, p. 21).

AT&T asserts that universal service support should be assessed on providers of intrastate telecommunications services. Specifically, support should be based on the relative percentage of gross revenues from all intrastate telecommunications related services, (including local, toll,

access services, advanced and vertical services, and yellow pages), less payments to other carriers. AT&T maintains that exclusion of payments to other carriers eliminates double taxation on these revenues. The assessment of wireless carriers should be based on revenues from originating calls, because unlike customers of other services, wireless customers typically pay for each call whether they are on the originating or terminating end (Direct, Attachment A, p.1).

UTSE maintains that all telecommunications carriers offering intrastate telecommunications services for a fee to the public within the state of Tennessee should contribute to the universal service fund on the basis of their relative share of intrastate retail "end user" telecommunications revenues generated or billed to an end user. (Direct, p. 19).

#### **Findings**

The Federal Telecom Act sets forth requirements for universal service. Section 254 of the Act states that "all telecommunication providers should support universal service in an equitable and nondiscriminatory manner." The fund being addressed by this Authority is completely intrastate. For this reason, it is appropriate that revenues on which assessments are based should be solely intrastate. The Authority also finds that contributions to the intrastate universal service fund should be based upon a percentage of total intrastate retail "end user" revenue of all providers of telecommunications services. This method will eliminate double counting of revenues by eliminating wholesale services from the base, resulting in an equitable and nondiscriminatory contribution for all carriers.

- 22. How may universal service support contributions be recovered by the carriers/providers making them?a. Can carriers contributing to the universal service fund recover those payments and if so how?
- 27. Should carriers' contributions to the USF be passed on to consumers, and if so, should the charges appear explicitly on the consumer's bill?

#### Position of the Parties

The Coalition maintains that contributions to the universal services fund in the state become a cost of providing service and each carrier should be allowed to recover these costs (Direct, p. 13).

BST asserts that recovery of universal service contributions can be achieved by an end user surcharge or by support in each carrier's rates. BST suggests that the contributions and payments be netted to determine the payment or receipt for each eligible telecommunications carrier. If a surplus results from this netting process, BST asserts that a dollar for dollar reduction be implemented in the rates of the ILEC to offset the net support received in the first year. (Martin Direct, p. 22)

MCI comments that implicit subsidies are recovered today through the rates of the carrier. MCI advocates changing this current practice in order to allow carriers to recover universal service support obligations through an explicit charge on the retail customers bill. Time Warner, TCTA and AT&T propose that carriers be allowed to recover universal support through an explicit surcharge.

UTSE maintains that customers should be aware of the amount paid to support universal service. Carriers should be allowed to recover support. Because recovery through an explicit surcharge will result in other rate reductions, UTSE proposes that carriers provide consumer education to inform end users of these rate reductions.

UTSE asserts that if an explicit surcharge is established for recovering the contributions that carriers make into the fund, then the rate rebalancing required would be dollar for dollar for the amount drawn out of the fund. Conversely, if the TRA chooses not to do an explicit surcharge, the rate rebalancing should address the net of the amount that a carrier draws out of the fund, dollar for dollar, as well as the amount that the carrier paid into the fund (Tr. v. III C, p. 146).

#### **Findings**

The Authority finds that carriers contributing to the Universal Service Fund should be allowed to recover their contributions from customers. The method for recovering these contributions will be addressed in Phase III once the total support has been determined.

- 23. How should the transition from the current system to the new systems take place?
  - a. What standards and criteria should govern the transition?
  - b. What information, cost studies, etc. should be gathered as transition occurs?

#### **Position of the Parties**

The Coalition maintains that it is probable that a transition period is needed and that cost recovery shifts should be addressed at that time.

BST asserts that the TRA address the implementation of the Tennessee universal service fund in Phase III of this proceeding. At that time, reductions to eliminate implicit subsidies as well as the mechanics of the fund can be addressed together with necessary issues relative to the transition from the current system to the new system.

UTSE believes this implementation issue can be best addressed in Phase III of this proceeding. Consideration of this issue should include any federal level decisions that impact state universal service funding.

#### **Findings**

During Phase III of this proceeding, the TRA will determine the rate rebalancing plan for universal service. The Authority finds that standards and criteria relating to the transition shall be developed at the same time that the decision is made as to which rates to rebalance. By waiting until the size of the fund and the rates that need to be rebalanced are known, the TRA can best determine the effects to companies and customers, and further consider any needed transition measures. Therefore, the Authority finds that a determination regarding the transition from the current system to the new system shall be decided in Phase III of this docket.

## 24. How and by whom should a Tennessee universal service support system be administered and monitored?

Tenn. Code Ann. §65-5-207(c)(4) states that the Authority shall "[a]dminister the universal service support mechanism in a competitively neutral manner, and in accordance with established authority rules and federal statutes." Thus, the Authority must select an administrator and must adopt all necessary administrative rules and procedures to govern any established universal service fund.

The Authority's selection of a fund administrator and the duties vested thereto are critically important to the provisioning of universal services in a competitively neutral manner. Within a control framework as yet to be established by the Authority, the administrator will be directly responsible for ongoing fund management, including but not confined to, billing of telecommunications providers for universal service support and distribution of the same to eligible telecommunications carriers. Such fund management activities must be conducted so as not to hinder the development nor limit the advancement of competition in any telecommunications market in Tennessee.

The Attorney General has issued an opinion stating:

1) if the TRA establishes a universal service fund pursuant to Tenn. Code Ann. § 65-5-207, the funds from contributing utilities must be deposited with the Treasurer of the State of Tennessee and the interest generated by those funds will become public money and revert to the general fund; and

2) neither Tenn. Code Ann. § 65-5-207 nor other statutes pertaining to the TRA vest in that agency the power to enter into the type of contracts and agreements that would be necessary for the TRA to delegate its authority to administer a universal service fund.<sup>30</sup>

## 24a. Can providers that make both contributions and receive support off-set those in supporting the fund?

#### **Position of the Parties**

AT&T stated that providers who make contributions to universal service and receive support from such services should be allowed to offset those amounts to be received when paying into the fund. Most of the parties, however, did not believe that this particular facet of fund administration needed to be addressed at this point. MCI and TCTA/Time Warner agreed that an industry subgroup should be appointed to recommend specific criteria and guidelines for fund administration, including guidelines for any adjustments to the contributions or distributions of fund participants. The Coalition asserted that whether netting of contributions and support should be allowed would depend on the determined mechanics of the fund, and BST said that it was not necessary to determine the specifics of fund administration at this time.

#### **Findings**

Whether off-setting of contributions and support should be allowed (and, if allowed, the

Tennessee Regulatory Authority Administration of a Universal Service Fund for Telephone Service, Op. Tenn. Atty Gen. 98-177, August 1998.

exact procedure for doing so) is an administrative issue that should be considered when specific fund administration procedures are developed. Therefore, the Authority finds that this issue should be addressed as part of the development of specific fund administration procedures.

24b. Can TRA designate a third party administrator or must it administer the fund itself? If so, how is the administrator chosen? If not, should a division within agency be created?

#### **Findings**

The Attorney General's opinion discussed above addresses the TRA's inability to designate a third party administrator. Per the opinion, neither Tenn. Code Ann. § 65-5-207 nor other statutes pertaining to the TRA vest in that agency the power to enter into the type of contracts and agreements that would be necessary for the TRA to delegate its authority to a third party administrator to administer the universal service fund

## 24c. What duties will be separated between the administrator and the TRA Directors?

#### Position of the Parties

All of the parties offering testimony on this issue commonly agree that duties assigned to the administrator should be consistent with the Authority's Order on universal service, and that the Authority should maintain broad oversight responsibilities with respect to the universal service fund. MCI and TCTA/Time Warner also state that the Authority should appoint an independent, third-party auditor to perform an annual audit of any established fund.

#### **Findings**

The appropriate time to address the duties of the universal service fund administrator is in Phase III after the need for such a fund has been established in Phase II of this docket. Therefore, the Authority finds that consistent with issues 24(a) and 24(b), this issue shall be deferred until Phase III.

## 24d. Should the TRA determine the cost of personnel, equipment and facilities needed by the administrator and build that cost into universal service fund?

#### **Findings**

Fund administration expenses should be collected and paid from the fund. Such expenses are legitimate, essential costs of providing and monitoring universal service support in Tennessee and accordingly, they are reasonable administrative reimbursements which should be included in funding requirements. The need for recovery of fund administration expenses is clearly recognized and authorized by state universal service statutes. Tenn. Code Ann. §65-5-207(c)(3) states that the TRA shall "[o]rder only such contributions to the universal service support mechanism as are necessary to support universal service and fund administration of the mechanism." (Emphasis added.) Recovery of administrative overhead is also consistent with federal practices that permit annual administrative costs to be included in projected universal service support expenses.

All reasonable and necessary administrative costs, such as personnel, equipment, facilities, and studies needed by the administrator should be built into the cost of universal service support and recovered from the fund. Additionally, any needed administrative or legislative action to optimize the effectiveness and cost efficiency of the fund should be pursued.

- 25. How will the TRA make sure the universal service system is nondiscriminatory and competitively neutral?
  - ${\bf a.}\ \ Does\ the\ TRA\ need\ to\ develop\ specific\ guidelines\ to\ ensure\ nondiscrimination\ and\ neutrality?$
  - b. How should the TRA handle complaints that the universal service system is discriminatory and not competitively neutral?

#### **Positions of the Parties**

BST and UTSE contend that requiring all eligible telecommunications carriers to participate, by assessing contributions on all providers and by making the fund portable, the TRA will assure that universal service support is available to any provider on a nondiscriminatory, competitively neutral basis (BST Brief, p. 57; UTSE Brief, p. 42; Martin Direct, p. 24).

AT&T asserts that a nondiscriminatory and competitively neutral universal service support system must be portable as a matter of policy and practice. Nondiscrimination requires entrants to have the same access to the fund, and to the network elements used to provide services, as has the incumbent. Competitive neutrality relates to new entrants' ability to win and serve customers who qualify for support (AT&T's Proposed Findings of Fact and Conclusions of Law, p. 60. See also Gillan Direct, Attachment A, p. 3).

As a matter of law, AT&T argues that Sec. 254 of the 1996 Act permits the FCC to adopt "[s]uch other principles as the Joint Board and the [Commission] determine are necessary and appropriate for the protection of the public interest, convenience, and necessity and are consistent with this Act." (Sec. 254(b)(7)) The FCC's Universal Service Order adopts the additional principle of competitive neutrality (para. 47.):

Competitive Neutrality: -- Universal service support mechanisms and rules should be competitively neutral. In this context, competitive neutrality means that universal service support mechanisms and rules neither unfairly advantage nor disadvantage one provider over another, and neither unfairly favor nor disfavor one technology over another.

In the event that the TRA must handle complaints that the system is discriminatory and not competitively neutral, AT&T points to the TRA Phase I Order and finds that the TRA has audit powers that could be used for policing and investigation purposes (Phase I Order, p. 50). AT&T concludes, however, that no special procedures are required at this time.

MCI maintains that if the amounts to be paid into the Tennessee Universal Service Fund are based on the end-user telecommunications revenues billed by the participating telecommunications carrier, net of payments to other carriers, the allocation of funding will be competitively neutral by eliminating the possibility of "double counting" revenues (Hyde Direct, p. 6).

The Coalition, states: "If a sound plan is developed, with reasonable cost allocation and recovery for all carriers, and if the plan is applied to all participants in the same manner, then it should follow that the plan is competitively neutral" (Watkins Direct, p.15).

#### **Finding**

Tennessee law gives the TRA considerable power to address the appropriateness of any universal service mechanism. The Tennessee statute on Universal Service, Tenn. Code Ann. § 65-5-207, touches on the issue of competitive neutrality and nondiscrimination at several points. First, Tenn. Code Ann. § 65-5-207(c) states that the Authority shall create an alternative universal service support mechanism "only if the alternative will preserve universal service, protect consumer welfare, be fair to all telecommunications service providers, and prevent the unwarranted subsidization of any telecommunications service provider's rates by consumers or by another telecommunications service provider."

Tenn. Code Ann. § 65-5-207(c)(4) further requires that the authority "administer the universal service support mechanism in a competitively neutral manner, and in accordance with

established authority rules and federal statutes." Tenn. Code Ann. 65-5-207(c)(8)(ii) requires the authority to consider "the extent to which rates for basic residential local exchange telephone service should be required to meet the standards of Tenn. Code Ann. § 65-5-208(c)." Tenn. Code Ann. § 65-5-208(c) states: "The authority shall, as appropriate, also adopt other rules or issue orders to prohibit cross-subsidization, preferences to competitive services or affiliated entities, predatory pricing, price squeezing, price discrimination, tying arrangements or other anticompetitive practices." TRA Rule 1220-4-8-.09 (rule 9 of the "Local Competition Rules") implements this section of the statute. Finally, Tenn. Code Ann. § 65-5-207(d) states that "the authority shall monitor the continued functioning of universal service mechanisms and shall conduct investigations, issue show cause orders, entertain petitions or complaints, or adopt rules in order to assure that the universal service mechanism is modified and enforced in accordance with the criteria set forth in this section."

The public interest defined in Tennessee law goes far beyond the mere competitive neutrality and non-discrimination of the federal Act and the FCC's Order, but it also includes consumer welfare, fairness to all telecommunication service providers, and the prevention of "unwarranted" subsidization of rates, as well as various anticompetitive practices. Nevertheless, these additional factors are not inconsistent with the Act or the FCC's rules.

For these reasons, no specific guidelines to address competitive neutrality or nondiscrimination are needed, as the TRA's existing statutory authority, rules and complaint procedures are adequate to address future disputes on these points.

### 26. When will universal service be addressed again?

#### **Findings**

Consistent with federal and state law, the Authority has the option of re-evaluating the fund at any time. The fund should be carefully monitored and appropriate adjustments made as needed from time to time. Therefore, no deliberations on this issue are necessary at the current time.

## 28. How should the cost of providing Lifeline and Link-Up services be determined and recovered?

The TRA, by its order entered November 7, 1997, decided to continue to provide \$3.50 per month intrastate support for Lifeline customers. The TRA's decision to provide \$3.50 per month in intrastate support for the Lifeline program allows Tennessee Lifeline customers to receive \$10.50 per month in total Lifeline support (\$3.50 intrastate support and \$7.00 interstate support). By its order entered May 20, 1998, the TRA found that the intrastate portion of Lifeline and Link-Up shall be funded from the intrastate Universal Service Fund. Link-Up is 100% federally funded; therefore, no intrastate cost determinations or recovery mechanisms are necessary. The issue currently before the TRA is the determination of the intrastate cost of providing Lifeline and the method for recovery of this cost.

#### **Position of the Parties**

UTSE maintains that since the Link-Up Tennessee program is 100% funded through the federal universal service program, the only cost recovery issue pertains to the provision of Lifeline service in the state. Effective January 1, 1998, UTSE's Lifeline program was expanded, in accordance with the FCC Order, to include all classes of residential service. UTSE believes it is premature to attempt to quantify the amount of intrastate support needed from the Tennessee

Universal Service Fund due to the short timeframe in which the expanded program has been in place.

MCI asserts that historically state Lifeline and Link-Up programs have been funded out of ILEC over-earnings. MCI states that the TRA should insure that this fact is recognized if future Lifeline and Link-Up programs are to be funded through an explicit Universal Service fund. To do otherwise results in a windfall to BST and UTSE (Direct, p. 5).

#### **Findings**

In the Phase I Order, the TRA ordered the following "core" services to be supported by the intrastate universal service fund: the primary access line consisting of dial tone, touch-tone and usage provided to the premises of a residential customer for the provision of two-way switched voice or data transmission over voice grade facilities, Lifeline, Link-Up Tennessee, access to 911 Emergency and educational discounts existing on June 6, 1995. Further, the TRA also found that Lifeline and Link-up services shall be funded through a separate, specific fund within the intrastate Universal Service Fund. Since the Link-Up Tennessee program is 100% funded through the federal universal service program, the cost recovery issue is applicable only to the provision of Lifeline service in Tennessee. The intrastate cost of Lifeline should be determined by multiplying the number of Lifeline customers by the interstate Lifeline credit of \$3.50. The method for recovering contributions and rate rebalancing will be addressed in Phase III.

<sup>&</sup>lt;sup>31</sup> Phase I Order, p. 53

#### **Additional Findings**

As part of the Phase II decision, companies are to submit revised studies in compliance with the Phase I and Phase II decisions. Additionally, BST and UTSE must provide AT&T with the relevant information needed to comply with the Authority's decisions. All parties must be given the opportunity to review the revised cost studies and comment on their compliance with the Phase I and Phase II Orders.

Based upon the foregoing Findings of Fact and Conclusions of Law,

#### IT IS THEREFORE ORDERED THAT:

- 1. The minimum Universal Service support is the total difference between the cost and the revenue benchmark summed over the wire centers in which cost exceeds revenue, less federal support;
- 2. The TRA shall promulgate the necessary rules and procedures to administer the universal service fund;
- 3. The selection of a particular location algorithm, which would essentially eliminate one of the cost models from further consideration, is not appropriate at this time;
- 4. The wire center line counts in both models shall be the most recent available counts of actual lines served by each wire center. BST and UTSE are to provide the wire center line count to other parties in order for them to run their models;
- 5. No specific model changes are required relative to the method(s) used to determine the proper outside plant mix and associated materials and installation costs;
- 6. Both models shall include the per foot drop wire costs used by the HAI model. In addition, the BCPM model shall be adjusted to reflect a 100 foot input for aerial and buried drop length;

- 7. For aerial support structures, the models shall reflect three other entities sharing the structure with the ILEC, for a total of four. For buried distribution structures, the models shall reflect one other entity sharing with the ILEC, for a total of two;
- 8. The fiber/copper break point in the BCPM model shall be increased from 12,000 feet to 18,000 feet and the number and capacity of DLCs shall be adjusted to reflect this change in the break point. The BCPM shall be adjusted to include the RUVG2 range extension card in place of the REUVG card;
  - 9. No wireless threshold is adopted;
- 10. The HAI inputs shall be used in both models for determining the materials and installation costs of manholes, poles, anchors, guys, aerial cable, and building attachments;
- 11. The HAI inputs shall be used in both models for calculating the cost of the NID. The BCPM shall be amended to include the NID costs included in the HAI model as presented to the Authority in this proceeding;
- 12. The HAI inputs shall be used in both models for determining the cost of installing SAIs and the BCPM shall be adjusted accordingly;
  - 13. No adjustments to the fill and utilization factors used in the models are required;
- 14. No changes are required in either model with respect to the method used to determine the mix of host, stand-alone, and remote switches;
- No changes shall be made in either model with respect to switch capacity constraints;
  - 16. Switching investment costs shall be determined as follows:
    - a. BST and UTSE shall adjust the BCPM by adjusting the "effective discounts" used in the BCPM's Switching Module to reflect vendor discounts on switching equipment equal to those ordered by the Authority in Issue 14 of Phase I of Docket 97-01262. Likewise,

- AT&T and MCI shall use these recommended discount levels where appropriate in the HAI.
- b. BST shall <u>not</u> include its proposed stand-alone costs for vertical features in its cost estimates.
- c. UTSE shall not perform the input changes originally used to allow the BCPM calculations to include the costs of vertical features.

#### d. BST and UTSE shall:

- i) use the switch curves derived from the Bellcore SCIS model;
- ii) use the output from underlying SCIS calculations when SCIS/MO is run in its marginal mode; and
- iii) recalculate switch usage charges per CCS as follows: First, subtract non-traffic sensitive line termination costs and getting started investments from total switch investments. Second, divide the resulting amount by the volume of busy hour calls measured in CCSs.
- 17. No adjustments to the models for inter-office trunking, signaling and local tandem costs are required;
  - 18. No changes to the inputs of either model for general support facilities are required;
- 19. The economic depreciation rates and associated inputs prescribed by the FCC and the TPSC in 1993 shall be included in both cost models;
- 20. BST and UTSE shall reduce the 1996 normalized Network Operations Expenses in the BCPM Model by 22.5%;
- 21. Cost studies shall include all local usage since the revenue benchmark includes all residential services as determined in the Phase I Order;
- 22. A cost of equity of 12.46% shall be used in all cost models estimating universal service costs for both BST and UTSE. A percentage of 60% shall be used in both models for estimating the costs of equity for BST as well as UTSE;

- 23. The cost of debt used by both models in estimating cost for BST and UTSE shall be 6.68%, which results in an overall cost of capital for BST and UTSE of 10.15%;
- 24. All rate rebalancing issues and proposals will be considered during Phase III of the docket;
- 25. A rulemaking shall be initiated for the purpose of establishing new telephone quality of service standards to replace Chapter 1220-4-2;
- 26. Contributions to the intrastate universal service fund shall be based upon a percentage of total intrastate retail "end user" revenue of all providers of intrastate telecommunications services;
- 27. Carriers contributing to the Universal Service Fund shall be allowed to recover their contributions from customers. The method for recovering these contributions will be addressed in Phase III once the total support has been determined;
- 28. A determination regarding the transition from the current system to the new system shall be decided in Phase III of this docket;
- 29. Contributions and support shall be addressed as part of the development of specific fund administration procedures;
  - 30. Issues pertaining to the administration of the Fund shall be deferred until Phase III;
- 31. All reasonable and necessary administrative costs, such as personnel, equipment, facilities, and studies needed by the administrator shall be built into the cost of universal service support and recovered from the fund;
- 32. The intrastate cost of Lifeline should be determined by multiplying the number of Lifeline customers by the interstate Lifeline credit of \$3.50. The method for recovering contributions and rate rebalancing will be addressed in Phase III;

- 33. Companies shall submit revised studies in compliance with the Phase I and Phase II decisions. BST and UTSE must provide AT&T with the relevant information needed to comply with the Authority's decisions. All parties shall be given the opportunity to review the revised cost studies and comment on their compliance with the Phase I and Phase II Orders;
- 34. To complete the cost revenue benchmark studies, the following schedule was adopted by the Authority:
  - a. BST and UTSE shall file compliant revenue benchmark studies, including detailed support, with the Authority and parties within seven (7) days of the date of this order;
  - b. BST and UTSE shall provide the line counts and primary residential lines for each wire center to the Authority and the parties within seven (7) days of the date of this order;
  - c. Each party shall submit revised cost studies and supporting calculations, compliant with this order and the Phase I order, within fourteen (14) days of the date of this order. Cost studies shall be submitted both in writing and electronically. Each party shall submit a spreadsheet for each wire center showing:
    - i) the number of primary access lines;
    - ii) the revenue benchmark per primary access line;
    - iii) the average compliant cost per primary access line per the BCPM model;<sup>32</sup>
    - iv) the average compliant cost per primary access line per the HAI model;
    - v) the CLLI code. This spreadsheet shall be submitted both in writing and electronically using Microsoft Excel.
  - d. Each party shall submit comments on the compliant cost studies and revenue benchmark submissions within thirty (30) days of the date of this order;

<sup>32</sup> Average costs shall be compliant with the findings in this order and in Phase I of this docket.

35. Any party aggrieved with this Interim TRA decision on docket 97-00888 may file a Petition for Reconsideration with the TRA within ten (10) days from and after the date of this Order.

Melvin J. Malone, Chairman

H. Lynn Greer, Jr., Director

Sara Kyle, Director

ATTEST:

K. David Waddell, Executive Secretary

### Universal Service (Phase II)

### Docket 97-00888

## **List of Commonly Used Abbreviations**

Benchmark Cost Pricing Model
Consumer Advocate Division
Competing Local Exchange Carrier
Census Block Group
Carrier of Last Resort
Eligible Telecommunications Carrier
Federal Communications Commission
Incumbent Local Exchange Carrier
Interexchange Carrier
Local Exchange Carrier
Telecommunications Act of 1996
Tennessee Regulatory Authority
Tennessee Relay Center
Unbundled Network Element
Universal Service Fund